NETWORK WORLD

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COMPUTER INQUIRY III

FCC ruling advances telco data networks

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The Federal Communications Commission closed the books on its Third Computer Inquiry last week by ruling that AT&T and the Bell operating companies can provide protocol conversion without setting up separate subsidiaries.

The FCC labeled protocol processing an enhanced service subject to the accounting and other so-called nonstructural safeguards outlined in Phase 1 of the Computer III decision is-

See **Computer III** page 54

NETWORKING STRATEGY

AT&T's data group looses product blitz

Compatibility stressed throughout new offerings.

BY PAULA MUSICH
Senior Editor

NEW YORK — AT&T's Data Systems Division last week unveiled a bevy of new networking products designed to flesh out the company's data-networking strategy, a strategy that emphasizes connectivity with other vendors' products.

The products, announced by new Data Systems chief Vittorio Cassoni, are the first to come out of AT&T in more than a year and signal that the company has not given up on the computer business. With their introduction, AT&T hopes to shore up its sagging computer division, which has lost an estimated $800 million to $900 million in the last three years.

Serving as a cornerstone of the announcement were several communications enhancements for AT&T's 3B2 line of minicomputers. These include: support of IBM's LU 6.2 protocol; a software facility that allows 3B2s to exchange documents with IBM Professional Office System (PROFS) and DISOSS environments,

See **AT&T** page 51

APPC NETS

Future is now for LU 6.2 user

BY JIM BROWN
New Products Editor

MADISON, Wis. — While other users are still experimenting with IBM's LU 6.2, American Family Mutual Insurance Co. is already reaping the benefits of the programming interface by using it to link 50 remote System/36 PCs to its corporate data center here.

American Family developed its own COBOL-

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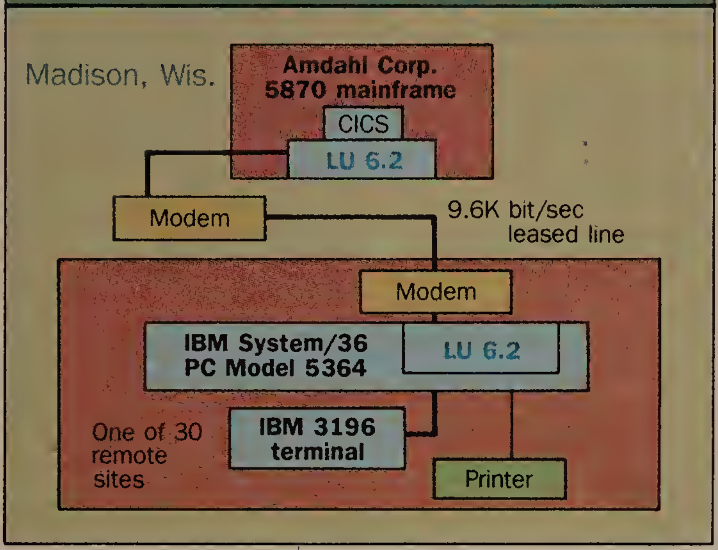
American Family Mutual Insurance Co. builds on LU 6.2



NETWORK LINE

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Does telecommunications really play a strategic role in today's corporate world? A select group of senior managers and telecom department heads jointly discuss their views. Page 47.

NEXT WEEK

Next week, *Network World*'s special section on Digital Equipment Corp. will feature an interview with Ken Olsen, DEC's founder and president.

PRODUCT FOCUS

Buying a PBX solely on price may put managers at peril

BY JOHN J. HUNTER
Contributing Writer

Thinking about signing for a new digital private branch exchange? Judging by current prices and features, the time has never been better. But if upper management pressures you to buy solely on the basis of price, features or the vendor's size, you might get your head handed to you later by those same executives. Communications managers should weigh service and support heavily in their vendor analyses.

In terms of features, the current PBXs are better than ever. They accommodate more lines, promise more non-

☞See **Switch** page 41

MANUFACTURING NETS

DEC's Olsen assails GM, MAP

BY BOB WALLACE
Senior Editor

ROXBURY, Mass. — Digital Equipment Corp. President Ken Olsen took a broad swipe at General Motors Corp. and its Manufacturing Automation Protocol factory standard last week at a press conference called to introduce a slew of new factory communications products based on DEC's own network architecture.

"Why do we need another network?" Olsen said of MAP, which is based on broadband network technology.

"We have an industry standard network today with Ethernet. Broadband networks are great. Every university should have one," he said. "But if I were a plant manager, I wouldn't put one in my factory."

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NEWSPAPER

▶ IBM NETWORK BLUEPRINT

IBM announcement may muddy NETBIOS waters

BY PAUL KORZENIOWSKI
Senior Editor

Sources close to IBM say the company will make an important announcement regarding its Network Basic I/O System later this week. While it is not clear what the announcement will involve, it is likely to raise more questions than it answers regarding the future role the programming interface will play in IBM's mainstream network architecture.

The NETBIOS announcement is expected as part of a product rollout that may include new models of the Personal Computer and a 16M bit/sec version of the company's Token-Ring Network. An IBM spokesman acknowledged the NETBIOS announcement, but declined to comment further.

Users and analysts have expressed confusion regarding IBM's future plans for NETBIOS as it moves to integrate its local nets into Systems Network Architecture. While some believe that NETBIOS will be phased out, others contend that IBM will enhance the programming interface, putting NETBIOS in contention with LU 6.2 in IBM's networking strategy.

Since its introduction a few years ago as part of IBM's first local network for Personal Computers, the PC Network, NETBIOS has been portrayed as a poor cousin to LU 6.2, a protocol that supplies similar features but within the larger context of IBM's SNA.

"NETBIOS is a stopgap measure that IBM is using to support some users until the company puts LU 6.2 firmly in place," said L. David Passmore, group manager at Network Strategies, Inc., a consulting company in Fairfax, Va.

Most observers, including some large IBM customers, agree with Passmore's assessment. Eugene

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▶ ACQUISITIONS

Siemens purchases Tel Plus

Boosts sales arm.

BY BOB WALLACE
Senior Editor

BOCA RATON, Fla. — In a calculated move to extend the reach of its product distribution network in the U.S., Siemens Information Systems, Inc., last week completed the acquisition of Tel Plus Communications, Inc., the nation's largest independent distributor of telecommunications systems.

Siemens, which over the last three years bought a 35% stake in Tel Plus, purchased the remaining 65% of the company for $173 million. The acquisition also gives Siemens full control of Telecom Plus Supply Corp. and Telecom Plus Rental Systems, Inc.

Dietrich Arbenz, marketing and sales vice-president of Siemens' Communications Systems and Networks Group, said the company must continue to enhance its distribution system if Siemens is to realize its goal of capturing 10% of the U.S. private branch exchange market by 1990. "To go after this market share, we must expand our distribution channels as well as our product line. The purchase of Tel Plus will allow us to increase our volume of equipment sales," he remarked.

Arbenz said Siemens would soon create a national accounts program

See **Siemens** page 6

▶ USERS GROUPS

TCA weighs expansion

BY MICHAEL FAHEY
Staff Writer

SEATTLE — The Tele-Communications Association (TCA), one of the most respected and influential users groups in the U.S., is poised to embark on an ambitious expansion plan that would establish TCA chapters in every state and in foreign nations, *Network World* learned last week.

Top officials of the TCA, which currently has seven chapters in five Western states, have sent ballots to the group's roughly 2,600 members, asking them to approve changes to the organization's bylaws that would enable the TCA to expand nationally and internationally. One of the changes would involve a restructuring of the TCA's governing board to accommodate representatives from a larger number of chapters.

Ballots containing the so-called "Vision and Mission" proposal must be returned by mid-April, and results of the voting will be revealed in May. A simple majority is needed to ratify the plan.

Two of the organization's top officials, Chairman of the Board Prince Dyess and President Lionel Gillerman, revealed details of the proposed expansion plan at the annual meeting of the TCA's Northwest chapter. The meeting, held last week, drew 4,000 attendees.

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STARLAN STANDARD

NEW ORLEANS — The IEEE 802.3 committee last week gave its final stamp of approval to 1Base5, a standard for AT&T Starlan look-alike networks, and voted the standard be moved to the IEEE for final approval this June.

Only four comments were raised by the roughly 90 members of the 1Base5 task force, an IEEE affiliate. Issues raised were editorial in nature, not technical, according to Don Loughry, chairman of the 802.3 subcommittee.

"As far as I'm concerned, 1Base5 is solid," Loughry said. The proposal will now go through a third and final balloting of the general IEEE membership.

▶ SAN DIEGO COUNTY

Net scandal trial opens

BY MICHAEL FAHEY
Staff Writer

SAN DIEGO — Five men, including the former communications manager for San Diego County, are on trial for mail fraud in Federal District Court here in a case involving allegations of bid-rigging, bribery and kickbacks in the awarding of a $24 million contract to replace the county's telecommunications network.

The case, which could take as long as four months, got under way two weeks ago. Among the defendants is former San Diego County Communications Manager Abraham Stein, who allegedly rigged bids to favor Telink, Inc., an Anaheim, Calif.- based telecommunications vendor that was awarded the contract for the new network in 1982. ("San Diego crafts a cost-paring net," *NW*, Nov. 10.)

In addition to Stein, the defendants are Hilario "Larry" Gonzales, former director of the county's Department of General Services; James Linder, marketing director for Telink; Don Woodaman, president of Telecommunications Design Corp., an Orange County, Calif., consulting company; and Robert Schrieber, vice-president of Telecom Consultants.

According to Assistant U.S. Attorney Lantz Lewis, prosecutor in the case, the government alleges that bribes, including the procurement of prostitutes, were furnished to top county officials who used their influence to secure the telecommunications contract for Telink.

Earlier this year, Robert St. Pierre, executive vice-president of Telecommunications Design, pleaded guilty to mail fraud and agreed to testify for the government in the current trial.

In 1982, Telink was awarded a contract to provide the county with a microwave backbone telecommunications network. The contract was rescinded in 1983 after an investigation revealed allega-

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▶ PROJECT VICTORIA

PacBell sets trial date for a nonstandard ISDN

BY JOSH GONZE
Staff Writer

LOS ANGELES — Pacific Bell announced last week it will launch the first commercial test of Project Victoria in the fall, advancing the company's plan to offer ISDN-like services that do not conform to developing industry standards.

The purpose of the proposed marketing trial is to evaluate the commercial viability of the services Project Victoria can deliver, according to Michael Eastwood, executive director for new network applications at Pacific Bell.

Among the applications planned for the trial are support of point-of-sale terminals, home banking, central office-based local networks, electronic mail, fire and burglar alarms, home meter reading and support of debit-card terminals.

The trial is scheduled to take place in Los Angeles and will serve both residences and businesses. Approval from both the Federal Communications Commission and the California Public Utilities Commission is required. Pacific Bell plans to submit proposals to both regulatory bodies later this spring.

Pacific Bell's blueprint for Project Victoria differs radically from the Integrated Services Digital Network Basic Rate Interface proposed by the Consultative Committee on International Telephony and Telegraphy and already backed in both the U.S. and Europe.

Victoria's basic rate interface would enable conventional twisted-pair telephone wire to carry two 32K bit/sec voice channels and five data channels simultaneously, one at 9.6K bit/sec and four at 1,200 bit/sec. The CCITT specification, known as 2B+D, will support two 64K bit/sec voice/data channels and a separate 16K bit/sec data channel, also used for signaling.

Pacific Bell's Eastwood defended the maverick plan, explaining, "When you segregate the [bandwidth] into seven channels, you have a variety of applications you can provide to a residence on one wire pair, while with 2B+D, it's yet to be tested how you can split that data channel up into a variety of applications."

Victoria's lower bandwidth, which totals 80K bit/sec, enables signal transmission up to 18,000 ft, meaning that Victoria switches would be capable of reaching more customers, Eastwood said.

The ISDN proposal, which specifies a total bandwidth of 144K bit/sec, would limit signal-transmission distance to about 12,500 ft.

Pacific Bell also claims Victoria requires a smaller plant investment. "We can extend the life of the central office since Victoria can work with any type of central office that exists out there today. It is an adjunct upgrade to the existing central office," Eastwood said. Lower plant costs will also enable the company to offer Victoria services in areas of low demand.

Pacific Bell downplays the significance of the ISDN compatibility issue. Typically, Victoria and ISDN services will not be used for end-to-end connections, meaning that compatibility issues will be minimized, Eastwood said.

Pacific Bell's strategy is to minimize its investment, taking advantage of the existing network with as little capital input as possible, according to Marc H. Rudov, president of Telematics Resource Group, a Wellesley, Mass., consulting firm. "Pacific Bell's plan is to exploit the existing plant by overlaying new technology," he said.

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▶ OMNICOM

PC board supports OSI

BY PAUL KORZENIOWSKI
Senior Editor

VIENNA, Va. — Omnicom, Inc. recently announced a communications board that enables an IBM Personal Computer AT to support all seven layers of the International Standards Organization (ISO) Open System Interconnect (OSI) network model.

Osilogie/PC runs on top of Ethernet components. In addition, it supports Layers 3 through 7 of the OSI model.

The product conforms to the National Bureau of Standards' Phase 2 Implementors agreement for Technical and Office Protocols. These specifications carve out a subset from the broad OSI model and include items such as Class 4 Transport protocols, Internet Protocols, application control service elements and one application service, the File Transfer Access Method.

An IBM Personal Computer AT outfitted with the new Omnicom board can run OSI applications and transfer files to other makes and types of hardware equipped with similar OSI software.

Osilogie/PC operates like a front-end processor and performs OSI communications tasks. The board is equipped with a Motorola, Inc. 68000 microprocessor, 512K bytes of random-access memory and the hardware needed to attach a Personal Computer to an Ethernet network.

Omnicom and other vendors have offered OSI software for the IBM Personal Computer, but these products required too much RAM. Paul Luebbe, a consultant at Omnicom, said such products did not leave a user sufficient RAM to run an application program easily. He claimed that off-loading communications functions to a board enables all of a Personal Computer's memory to be used for running an application program.

Omnicom has been marketing Osilogie/PC, a series of software modules, for a few years. Omnicom has ported the software, which runs on top of existing operating systems, to approximately 20 types of hardware, including Digital Equipment Corp., IBM and Apollo Computer, Inc. products. Omnicom expects to port Osilogie/PC software modules to other members in IBM's Personal Com-

See **Omnicom** page 6

▶ MARKET MANEUVERS

AT&T seeks world marts

BY PAM POWERS
Senior Editor

NEW YORK — AT&T's growth "will have to come from markets beyond the U.S.," AT&T Chairman James E. Olson said last week in a speech that outlined the company's strategy for expanding its influence in nations where AT&T is not well-known.

"The U.S. market is still important to us, but the most promising areas for growth are beyond North America," Olson told members of the Foreign Press Association here. AT&T needs to expand its presence in Western Europe and the Far East, he said. Along with North America, those regions represent a $500 billion market for information movement and management products. The three regions also comprise 90% of the total worldwide market, Olson said.

"AT&T is a major player in only one leg of the triad, the U.S.," Olson said. "For AT&T, it is clear that growth will have to come from markets beyond the U.S. And that is where we are concentrating our resources today."

The underpinning of AT&T's international strategy is to form alliances with established foreign vendors, Olson said. Currently, AT&T has teamed up with 40 foreign vendors, including Ing. C. Olivetti & Co., S.p.A. in Italy, Philips Industries, N.V. in the Netherlands, and Ricoh Co., Ltd. and Toshiba Corp.

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▶ TRADE WAR

Japanese rule changes enrage foreign rivals

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The telecommunications trade war between Japan and the U.S. flared up recently when Japan proposed merging two groups that were formed to compete in international services with Japan's long-distance monopoly and recommended limiting foreign equity in that group to 3%.

The proposal by the Japanese Ministry of Posts and Telecommunications (MPT) has enraged foreign firms participating in the groups, including Pacific Telesis Group, and it has raised the ire of U.S. and UK leaders concerned about trade imbalances with Japan.

British Prime Minister Margaret Thatcher fired off a letter of protest to Japanese Prime Minister Yasuhiro Nakasone, and the U.S. Senate voted unanimously (93 to 0) in favor of a nonbinding resolution that calls on President Reagan to intervene.

The administration's Joint Economic Council and the U.S. Department of Commerce are expected to advise the president on an appropriate course of action by April 1.

Two consortia were formed

Two years ago, when Japan had originally decided to try to introduce international service competition to a market monopolized by long-distance giant Kokusai Denshin Denwa (KDD), two consortia were formed.

One group, led by C. Itoh & Co. Ltd., proposed competing with KDD by building a new transpacific fiber-optic cable between Japan and the U.S. The group consisted of Toyota Motor Corp.; the Industrial Bank of Japan Ltd.; Pacific Telesis, the San Franscisco-based Bell holding company; and Mercury Communications Ltd. of the UK.

The other consortium, called International Telecom Japan, is led by Mitsubishi Corp. and consists solely of Japanese companies. It has proposed competing with KDD by leasing capacity from the long-distance monopoly and reselling it at competitive rates.

The Japanese MPT later concluded that the international long-distance market in Japan could not sustain two companies competing with KDD.

For that reason, it proposed merging the two groups and limiting foreign equity in the combined group to 3%. Previously, the MPT permitted foreign telecommunications firms to hold up to a 33% stake in Japanese ventures.

Pacific Telesis' consortium maintains, however, that its research indicates the market can support three firms and perhaps even more.

KDD is even considering the construction of a second transpacific cable for its own use.

"We interpret the MPT's actions as an effort to negate foreign participation in the Japanese telecommunications market," said Ronald Stowe, vice-president of Washington operations for Pacific Telesis. "It's inconsistent with agreements the Japanese have made with the U.S."

Pacific Telesis and Mercury are hoping the Japanese Ministry of International Trade and Industry, and other policymakers will intervene "and ensure that a reasonable position is taken," Stowe said.

A 3% foreign investment in the cable project would not be sufficient to keep Pacific Telesis interested, Stowe said, nor would it provide sufficient foreign capital for the construction of the cable system. ☑

Bribery from **page 2**

tions of bribery and bid-rigging.

Since that time, a new bidding process was instituted, and Contel Business Networks won the contract to install a private backbone network for the county, replacing Pacific Bell service.

According to published reports, Assistant U.S. Attorney Lewis charged that Stein procured prostitutes for Gonzales. The reports quoted Lewis as saying that Stein procured the prostitutes to meet Gonzales' "unbridled sexual appetites" and to obtain information about Gonzales' "sexual escapades." This information, Lewis said, was described by Stein "as his hammer" to control Gonzales, who made recommendations to county supervisors regarding the telecommunications contract.

Stein's attorney, Mario Conte, said Stein was "a brilliant electronics engineer" who was simply interested in putting in a new telecommunications system, according to reports. Conte said the Telink system would have been far cheaper than service provided by Pacific Bell and would have saved taxpayers money.

Woodaman's attorney, Frank Vecchione, took a similar tack in defending his client. According to reports, Vecchione said his client only sought to benefit the county, which he believed would have saved money with Telink's net. ☑

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designed to pursue large-user contracts but would not say when the group would be assembled or what this organization would comprise.

Siemens said Tel Plus will continue to distribute communications systems ranging from small key telephone systems to high-end PBXs manufactured by several different vendors. By annexing Tel Plus, which will be operated as a separate subsidiary, Siemens acquired the firm's 27-state-strong distribution network and system maintenance contracts on an installed base of roughly two million lines.

Arbenz claimed the Tel Plus distribution network would not become an in-house sales force. Some industry analysts, however, are critical of Siemens' refusal to swap its current distribution network for a direct sales force. Greg Carlsted, a telecommunications group senior industry analyst with Dataquest, Inc., a San Jose, Calif.-based consulting and research firm, said a direct sales force is a must for those competing for sales of mid-range and large-sized PBXs.

"Success in this part of the market necessitates a direct sales force," Carlsted said. "The higher you go up the line-size scale, the more critical it is to have direct user contact without an intermediary."

Besides improving its channels of distribution, industry watchers say Siemens will have to accelerate plans to introduce its Hicom system to the U.S. market if it hopes to make its market share goal by 1990. Hicom is a high-end Siemens PBX distributed strictly overseas.

Despite competitive industry pressure, Arbenz said Hicom would not be brought to the U.S. until the size of the market for PBXs compatible with Integrated Services Digital Network had been determined. "This may take two or more years," he said.

Carlsted was skeptical of Siemens' chances of landing a tenth of the highly competitive PBX market by 1990.

"I think it's going to be extremely challenging for them to meet this goal," he predicted.

Omnicom from **page 4**

puter line.

Luebbe said Osilogie/PC will eventually support additional application protocols, such as message handling. These modules, which could be available by the end of the year, may be loaded into the board's 512K bytes of RAM. The initial release of Osilogie/PC takes up only 120K bytes of RAM.

According to Luebbe, Osilogie/PC is geared to large users developing OSI applications and OEMs that want to incorporate OSI capabilities into current products. He said European users are implementing OSI networks more readily than U.S. users. One French company has already installed OSI networks that support more than 200 users. He predicted U.S. companies will have similar types of installations running by the end of the year.

Luebbe said Osilogie/PC's capabilities resemble General Motors Corp.'s specifications for Manufacturing Automation Protocol 3.0, but it cannot be used with MAP 2.1 products.

Osilogie/PC costs $1,995 and is available now.

NETBIOS from **page 2**

Buechele, vice-president of engineering at Communications Solutions, Inc., a software firm in San Jose, Calif., points out that IBM has labeled LU 6.2 as a strategic product, has published documents defining the protocol and even tried to get LU 6.2 accepted by a standards group.

NETBIOS has never received that kind of treatment, he said.

While functionally similar at some levels, LU 6.2 is more robust than NETBIOS, Buechele said. "LU 6.2 defines how processors cooperate and defines how to control data transmitted between the devices," he said. "NETBIOS supplies only simple message-handling capabilities."

Trav Waltrip, vice-president of data processing at Travelers Insurance Co. in Hartford, Conn., described LU 6.2 as IBM's principal means of connecting any two processors, including connections between Personal Computers.

"Only certain applications like manufacturing require broadband capabilities," he said. "Those applications are suited to the IBM Personal Computer network and NETBIOS."

Some analysts say, however, there may be more life left in NETBIOS than many expect. "Most people haven't taken a close look at NETBIOS," said Rudy Strobl, a senior consultant at Arthur D. Little, Inc. in Cambridge, Mass. "If they did, they would be surprised at its capabilities."

Strobl claimed that NETBIOS has more features than LU 6.2. "NETBIOS encompasses five layers of a network model," he said. "LU 6.2 merely sits on top of a session layer. NETBIOS includes a session initiation mechanism that defines how an application can make calls to and from an operating system and outlines call structures. LU 6.2 lacks such capabilities."

Furthermore, Strobl said that SNA supports only virtual circuits, meaning it can only support point-to-point connections, a significant shortcoming for many large users. NETBIOS can support point-to-multipoint connections.

These benefits, and the fact that there is solid industry support behind NETBIOS, has led a number of minicomputer vendors to back NETBIOS despite growing support for LU 6.2. Tandem Computers, Inc. has already announced NETBIOS support and Digital Equipment Corp., Data General Corp. and Datapoint Corp. are reportedly ready to follow suit.

NETBIOS and LU 6.2 have been portrayed as antithetical protocols, but LU 6.2 applications can be run on top of NETBIOS. It is unclear what benefits users would gain with such a scheme. According to Buechele, "Users don't gain anything by running LU 6.2 on top of NETBIOS." But Strobl contends that this scenario would supply a number of benefits and deemed LU 6.2 as a suitable complement to NETBIOS.

This week's expected announcement may shed light on the debate. "I don't see IBM doing anything significant with NETBIOS," said Buechele. "Such a strategy runs counter to the company's push toward LU 6.2 and the Token-Ring Network."

He predicted that only cosmetic enhancements would be made to NETBIOS. For example, NETBIOS currently can support only 25 concurrent connections, a significant limitation for most large users. IBM could tweak the software to provide support for up to 255 connections.

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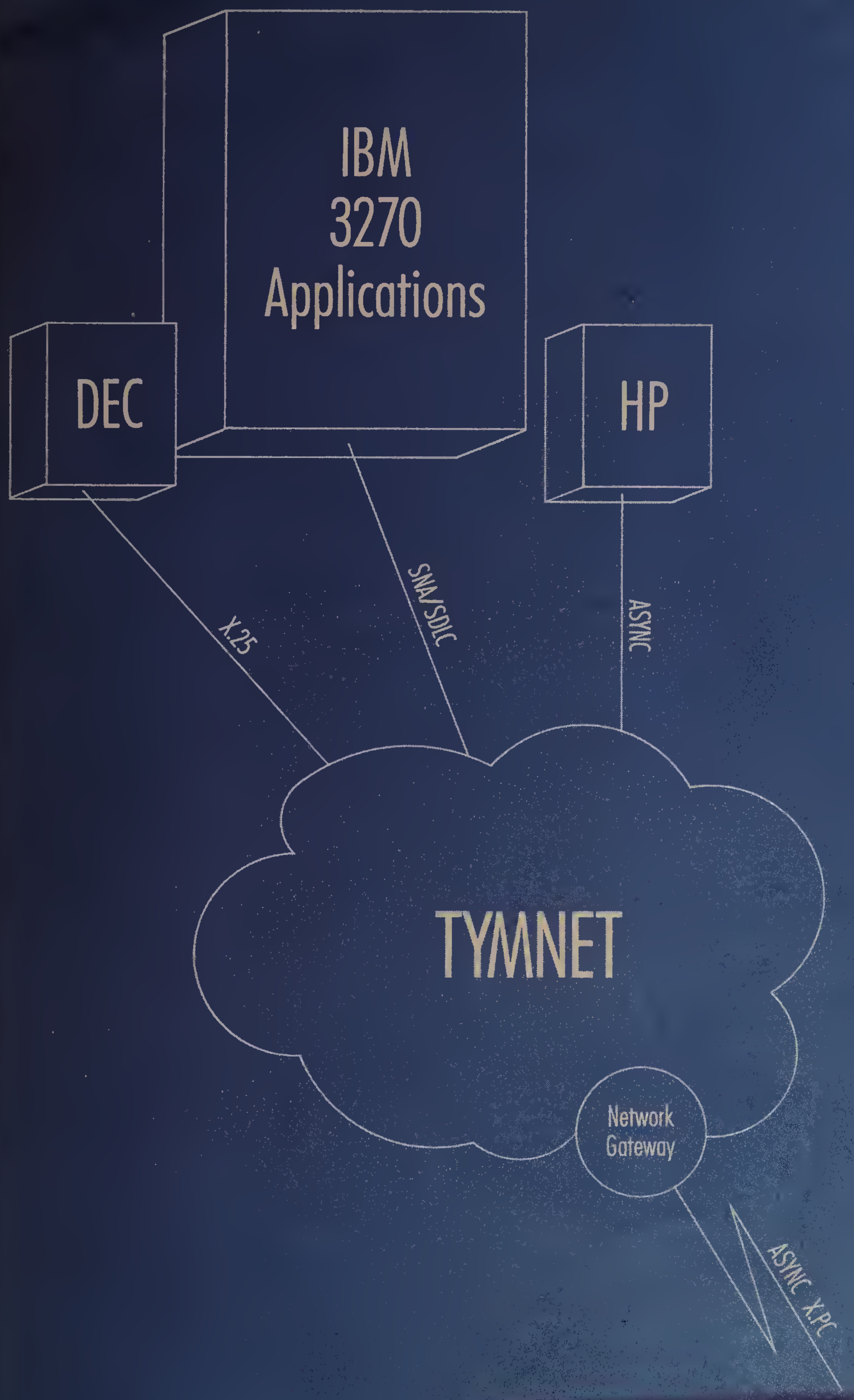

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MCDONNELL DOUGLAS

LU 6.2 from **page 1**

based claims-reporting application that incorporates LU 6.2 commands. Running on 50 IBM System/36 PC Model 5364s spread throughout 30 branch offices in 12 states, the application enables users to draw down data residing on an Amdahl Corp. mainframe at the data center and upload claims forms to the host.

The LU 6.2 application has sped claims processing and has saved users from the onerous task of entering data twice: once for the host system and once for local use.

"LU 6.2 is doing exactly what we wanted it to do," said Wayne Burmeister, director of data resources and administrative planning for American Family. "The application has cut costs and processing time by eliminating the time-consuming method of entering data twice, once to satisfy a mainframe application and once to create a local file."

Burmeister said remote users can automatically draw down customer information needed to complete a claims form simply by transmitting a policy number to the mainframe, which retrieves and transfers data such as policyholders' names and addresses. The application will also verify the existence of a policy before allowing the claim entry to proceed.

"The application almost works in an interactive mode, triggering transactions to our CICS network. The mainframe portion of the application sends the appropriate information back down to the System/36, where it is automatically merged into the document being prepared," Burmeister said.

Branch offices are linked to the data center via voice-grade leased lines using 9.6K bit/sec modems.

According to Applications Programmer Peter Frase, American Family's programmers attended an IBM conference on how to use LU 6.2 to build communications capabilities into programs. That, he said, helped the programmers understand how to take advantage of the LU 6.2 programming verbs. "Everything we have, we developed ourselves," Frase said.

Each System/36 PC runs IBM's APPC/36 software, which initiates machine-to-machine communications and converts data formats between the System/36 and the host, according to Ray Brown, a systems programmer. The package also makes the 3196 terminals attached to the System/36 PCs appear to the host as 3270-type terminals.

One of the roadblocks to widespread implementation of LU 6.2, many users say, is that it requires applications to be entirely rewritten. That was not an issue for American Family, which had already decided to replace existing branch office applications and aging equipment with new software and a standard hardware configuration, Burmeister said. System/36 PCs replaced processors from Wang Laboratories, Inc., Amtek Digital Systems, Inc. and NBI, Inc.

Installation time

American Family spent seven months installing the 50 IBM System/36 PCs, each of which supports up to 15 terminal users. The installation was completed in January, nine months after American Family awarded the equipment contract to IBM. It took American Family roughly four to five months to develop the application, which actually went into production after only half of the new systems were installed.

The firm's request for proposal stipulated that vendors would be given six weeks after filing their bids to demonstrate that their equipment and software could support the kind of distributed application American Family envisioned. IBM, Burmeister said, proved that using LU 6.2, applications running on the remote System/36 PCs could communicate with host-based software.

"I had hoped to have the programming half done by IBM, but it didn't turn out that way because our requirements were quite complex and application-specific," he said. "It took us a little bit longer to program than we anticipated, but that was due to the fact that we were learning System/36 programming and LU 6.2 at the same time."

In addition to easing communications between systems, LU 6.2 is being used to secure transmissions during line failures. Soon after the network was installed, a line failed while a transaction was in progress. Operators at both sites knew what happened and when the line came back up, the application resumed where it left off. The System/36 and the host buffered the transaction until the link was reestablished.

Brown said American Family is developing another LU 6.2 application that will allow any of 3,000 3270-type terminals in the firm's Systems Network Architecture network to produce form letters on the System/36. Terminal users would enter a request for a form letter, fill in variable information, merge some data from the mainframe into the form and send it to the System 36. There, it would be packaged and merged into DisplayWrite/36 word processing and then printed.

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Industry Update

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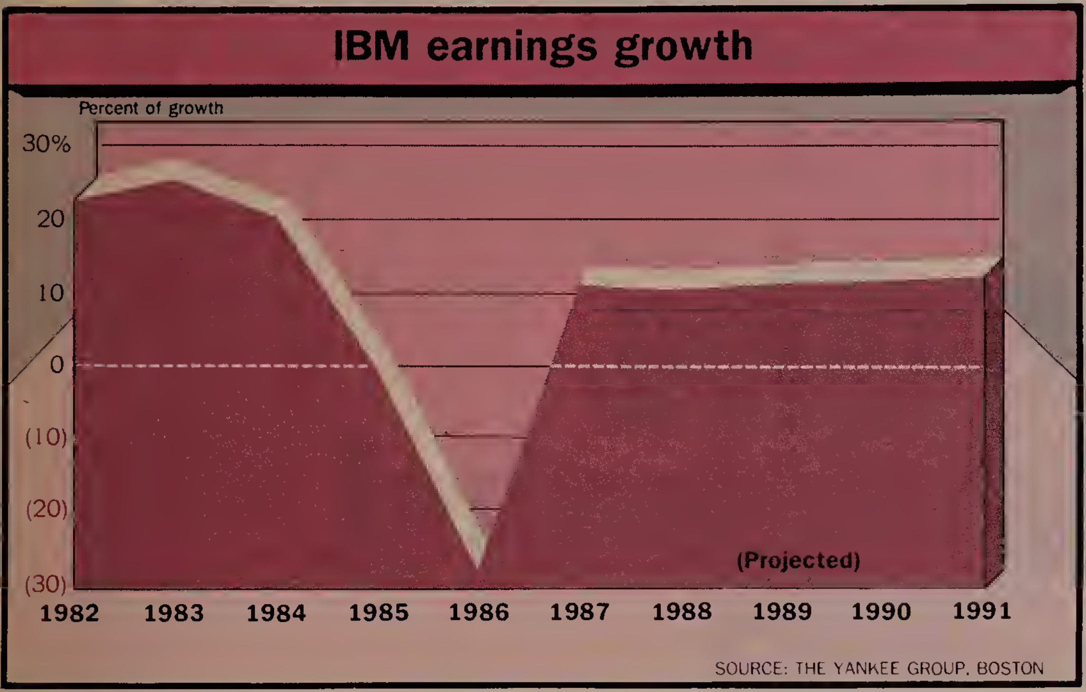

IBM earnings growth

SOURCE: THE YANKEE GROUP, BOSTON

▶ COST-CUTTING

Infotron lays off 100

BY PAM POWERS
Senior Editor

CHERRY HILL, N.J.— In an ongoing effort to cut costs, Infotron Systems Corp. recently laid off 12% of its domestic work force and said it expects to post its second consecutive quarterly loss. The company also announced the election of Robert E. Purcell to the post of chairman of the board.

President and Chief Executive Officer James C. Hahn said in an interview last week that the layoff of 100 employees is intended to reduce overhead. “Our overhead was increasing faster than our revenue, although we have shown annual revenue increases for the past 10 years,” Hahn said.

In December, Infotron took a fourth-quarter loss of $4 million, partly attributable to cost-reduction efforts. At that time, David Barnhill, vice-president of finance, indicated there would be layoffs in the coming quarter.

The fourth-quarter charge also was due to a $1 million write-down of investments, including a loss Infotron sustained from its 40% ownership of Applitek Corp., and a $500,000 inventory write-off of equipment the company resold for another manufacturer.

Barnhill indicated in December that some product lines were not selling as well as anticipated, but Hahn said the company has been “very pleased with product sales. We are focusing our attention on the T-1 market, particularly on the new NX4600 product, which is selling very well.”

Hahn said the cost-cutting efforts will not have an effect on new product development. Infotron plans to make several announcements around the third quarter, he said. Those announcements will include the next generation of 990 network processors and products addressing Integrated Services Digital Network and the local net market. Although he expects Infotron to take another loss this quarter, Hahn said he anticipates a “positive year” overall. He

See **Layoff** page 12

▶ DEREGULATION DEBATE

Rivalry lags in local loop

BOC strength hinders freedom bid.

BY PAM POWERS
Senior Editor

WASHINGTON, D.C. — Although local exchange bypass never materialized as the threat the Bell operating companies made it out to be, the issue is still a matter of heated debate, particularly now that the BOCs are seeking the right to compete in new businesses, such as long distance.

Once upheld as a significant threat to the health of the BOCs, bypass seems not to have caught on to the extent the industry once thought it would. Analysts and industry lawyers, noting the diminished use of the term recently, said that while many large corporations bypass the local exchange to some degree, studies indicate that almost all local traffic is still carried by public facilities.

The contention that there is minimal use of bypass begs the question of whether the BOCs monopolize the local exchange, and assuming they do, whether they should be allowed to compete in new businesses, including long distance.

“Over 95% of the access lines used by members of the Ad Hoc Telecommunications Users Committee are obtained from the BOCs,” said Jim Blaszak, a Boston attorney for that committee. “It’s economic poppycock to say that 5% bypass is enough to prove competition exists in the local exchange.” Blaszak said bypass statistics prove that the BOCs have complete dominance and control of the interexchange market.

“I don’t see how anyone logically could readmit the BOCs to the interexchange market,” said Page Montgomery, a vice-president with

See **BOCs** page 12

INDUSTRY EYE
JEFF PALMER

U.S. follows Europe’s X.25 lead

Increasingly, U.S. data processing users are following the lead of their European counterparts in employing X.25 networks as a highly reliable and cost-effective communications architecture to support multivendor data processing environments.

European countries have been deploying X.25-based networks over the past two decades. These packet nets are designed to meet multinational connectivity needs in an environment characterized by multiple public data networks and numerous DP vendors, all of which support proprietary communications architectures.

For several reasons, X.25 is gaining equal importance in the evolution of networks in the U.S. Here, the growth is spearheaded by communications vendors bringing X.25 network products to market, DP vendors providing X.25 interfaces and users building private X.25 networks.

Private X.25 networks are answering the user’s need for a common communications utility between applications and DP environments.

This approach controls and reduces costs and increases network management and flexibility.

Such a strategy is important now as users implement more communications-oriented applications and opt to spread their computer resources over a wider range of equipment.

While IBM retains its strong presence in U.S. DP departments, many large organizations have now committed themselves to additional DP environments, such as DEC and Wang Laboratories, Inc., each with its own network architecture.

To share communications resources and pass information across these architectures, a vendor-independent communications system is required, such as X.25.

X.25, as a computer-independent transmission technology, acts as an ideal partner to SNA. Private X.25 networks provide the transport service for SNA traffic and the capability for data exchange between separate systems. IBM recognizes the growing number of installations and the potential benefits of X.25. It has itself introduced a variety of X.25-compatible products.

As an internationally accepted communications standard, X.25 will continue to be supported in new and evolving communications architectures. This means users can connect

See **X.25** page 12

Palmer is vice-president of marketing for BBN Communications Corp., located in Cambridge, Mass.

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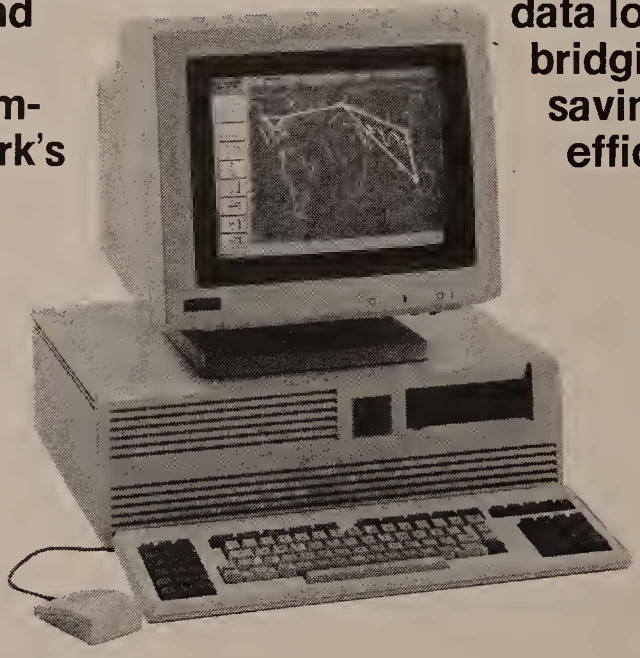

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X.25 from **page 9**

existing multiple logical networks now and can also connect to any new vendor-specific subnets they may install down the road.

The need for a common communications denominator grows urgent and clear, especially as organizations reach out beyond their corporate boundaries to link to overseas public data networks, hybrid private and public architectures and intercompany communications.

X.25 will continue to prosper in the U.S. and abroad. For companies creating their own private networks, where high-performance and strategically flexible architectures offer a competitive edge, X.25 is an opportunity.

Layoff from **page 9**

said the company would not lay off any more employees.

Stephen Cotler, a senior analyst with Montgomery Securities in San Francisco, said Infotron's prognosis depends to a large degree on its sales record for 1987.

"Infotron has a strong balance sheet, and its new T-1 product gives it a chance to compete against some big names like Cohesive [Network Corp.] and Network Equipment Technologies [Co.] But the market is fierce," Cotler said.

Separately, Infotron elected Purcell as chairman of the board last week, filling a post that has been vacant for years, a spokeswoman said. Purcell has been a director of the company for five years.

BOCs from **page 9**

Economics and Technology, Inc., a consulting firm in Boston.

"Bypass is not a conceivable threat to the BOCs' financial growth in the foreseeable future. In fact, I expect the BOCs to have more of a lock on the market a few years from now than they do at present," Montgomery said.

But the BOCs find fault with those arguments. Emanuel Klein, director of strategic marketing for Nynex Corp., said, "I don't have any numbers, but the local exchange is certainly a competitive environment." Nynex has a large competitor in the form of a teleport, he said, and customers also have the option of building private networks. "There are lots of choices," Klein insisted.

Officials at Bell Atlantic Corp. have numbers that they said demonstrate a significant amount of bypass. Alan Daley, a district manager with Bell Atlantic, said the BOC has commissioned studies which indicate that private microwave bypass increased tenfold between 1983 and 1986. "There is a lot of bypass in areas with major concentrations of traffic. That's when it becomes economical for large users to install their own facilities," Daley said.

Montgomery conceded that economic benefits are possible with large corporations, but said, "Bypass is still a limited phenomenon, and one that exists only on a discrete basis even within large companies."

Why users have not responded

The lackadaisical response to bypass from the user community is due to several factors, observers said. "Bypass takes what is a monthly expense item for the user and turns it into a big capital item," Montgomery said.

"For an item of that magnitude, you have to go to the board of directors or the chief financial officer. Most communications managers never get that far," Montgomery added.

Blaszak said bypass is a matter of simple economics. "Most companies operate on budget cycles that require knowledge of the payback associated with such a move. It gets difficult when you try to balance the enormous capital outlay against the potential long-term savings," he noted.

Also at issue when a company ponders the bypass question is the availability and effectiveness of BOC service. While a Touche Ross & Co. study indicated that users bypass to obtain the same service at lowered costs, an International Communications Association survey concluded that users bypass because of limitations in the quality and availability of local exchange services.

Doane Perry, a senior analyst with International Data Corp., posited that recent improvements in local exchange services will diminish future instances of bypass. "The BOCs have digital services at 19.2K and 56K bit/sec now, and they will have ISDN central office local-area networks. Their provisioning times are better. All that makes bypass less of a threat," Perry said.

Among those who have installed bypass facilities, at least one is puzzled that the movement hasn't gained more momentum. Bernard Weinstein, first vice-president of information systems and telecommunications at New York-based E.F. Hutton & Co., Inc., said, "The benefits have been dramatic for us. We have a lower bit error rate for less expense."

But Weinstein recognized the influence of the BOCs on the end user. "Mother Bell is a security blanket," he said. "There's a certain amount of inertia on the part of the user. The BOCs are the easy way out of things."

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TELECOM TRENDS

The Rolm/Timeplex connection

Rolm Corp. recently verified connectivity of its Rolm VSCBX and CBX II business communications systems with the Timeplex, Inc. Link/2 Data/Voice Network Exchange. The Link/2 Exchange, a T-1 network resource manager, uses the Rolm CBX T-1/D3 interface to operate with the Rolm systems.

REGULATION

US West wins joint sales OK

BOC can sell CPE, services together.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — US West, Inc. was recently granted an interim waiver by the Federal Communications Commission to market customer premises equipment and network services jointly to selected large business customers in its operating region.

US West is the second regional Bell holding company to receive FCC permission for its customer premises equipment and network services units to collaborate in order to provide its customers with one-stop shopping.

On Jan. 12, BellSouth Corp. became the first RBHC to be granted permission for joint marketing by the FCC.

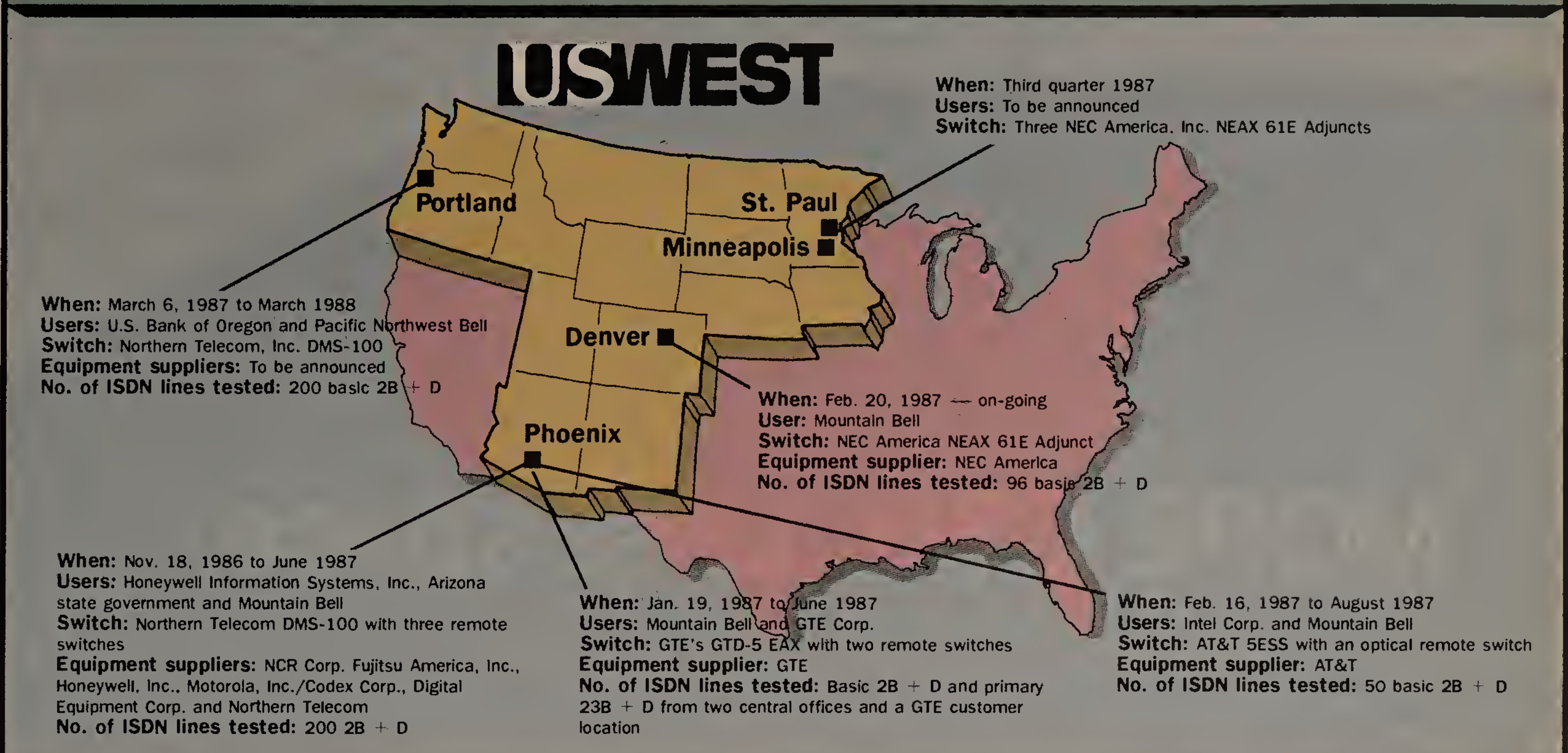
US West has targeted state and local governments and university markets for the initial phase-in of its joint marketing plan.

The joint marketing waiver process was enacted when the FCC decided to allow the Bell operating companies to market customer premises equipment without having to form a separate subsidiary.

Prior to that, the BOCs were re-

See **US West** page 14

US West, Inc. Integrated Services Digital Network trials


USWEST
Portland
St. Paul
Minneapolis
Denver
Phoenix
When: Third quarter 1987
Users: To be announced
Switch: Three NEC America, Inc. NEAX 61E Adjuncts
When: March 6, 1987 to March 1988
Users: U.S. Bank of Oregon and Pacific Northwest Bell
Switch: Northern Telecom, Inc. DMS-100
Equipment suppliers: To be announced
No. of ISDN lines tested: 200 basic 2B + D
When: Feb. 20, 1987 — on-going
User: Mountain Bell
Switch: NEC America NEAX 61E Adjunct
Equipment supplier: NEC America
No. of ISDN lines tested: 96 basic 2B + D
When: Nov. 18, 1986 to June 1987
Users: Honeywell Information Systems, Inc., Arizona state government and Mountain Bell
Switch: Northern Telecom DMS-100 with three remote switches
Equipment suppliers: NCR Corp. Fujitsu America, Inc., Honeywell, Inc., Motorola, Inc./Codex Corp., Digital Equipment Corp. and Northern Telecom
No. of ISDN lines tested: 200 2B + D
When: Jan. 19, 1987 to June 1987
Users: Mountain Bell and GTE Corp.
Switch: GTE's GTD-5 EAX with two remote switches
Equipment supplier: GTE
No. of ISDN lines tested: Basic 2B + D and primary 23B + D from two central offices and a GTE customer location
When: Feb. 16, 1987 to August 1987
Users: Intel Corp. and Mountain Bell
Switch: AT&T 5ESS with an optical remote switch
Equipment supplier: AT&T
No. of ISDN lines tested: 50 basic 2B + D

SOURCE: US WEST, INC., ENGLEWOOD, COLO.

CARRIER COMPETITION

Study questions Huber

User-sponsored critique cites flaws in industry report.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The Huber Report misrepresents the level of competition in the telecommunications industry and wrongly advocates letting the Bell operating companies into new market areas, according to a recently completed critique commissioned by two major users groups.

The critique, prepared by Economics and Technology, Inc. (ETI) of Boston, was cosponsored by the International Communications Association (ICA) and the Ad Hoc Telecommunications Users Committee. This study was submitted to U.S. District Court Judge Harold Greene on March 13. It concludes that the Huber Report does not provide a rational justification for abandoning the rules of the Modified Final Judgment that regulate BOC activities. The Huber Report is a study conducted by independent consultant Peter Huber for the Department of Justice on the state of competition in the telephone industry.

Greene is responsible for deciding whether the Modified Final Judgment should be amended to allow the BOCs to enter now-restricted business areas such as equipment manufacturing and information services. The U.S. Department of Justice recently recommended such modifications to the Modified Final Judgment, based on Huber's report.

Larry Blosser, an attorney who represents the ICA, said, "ETI's critique brings to light several problems and flaws in Huber's report." According to Lee Selwyn and Page Montgomery, ETI president and vice-president, respectively, and authors of the critique, there are serious questions about the soundness of Huber's facts and conclusions. "Huber failed to base his inquiry on some of the major tenets of divestiture," they concluded.

According to the Modified Final Judgment, in order to change decree restrictions, there must be proof that the industry has evolved significantly enough to warrant new rules. A critical analysis that attempts to show why the

See **Study** page 14

SATELLITE INDUSTRY

Burch to head INTELSAT

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Former Federal Communications Commission Chairman Dean Burch was recently elected director general of the International Telecommunications Satellite Organization by its 28-member board of governors.

The appointment is subject to approval of INTELSAT's 103-member Assembly of Parties at its April 1 meeting here. The members of the Assembly of Parties represent the 113 nations that participate in INTELSAT. Burch replaces acting Director General John Hampton of Australia, who took over after former Director General Richard Colino was suspended as a result of an investigation into alleged misdirection of INTELSAT funds.

Burch won out against Hampton, Pedro Castelo Branco of Brazil and Pekka Tarjanne of Finland. The latter two are directors of their nations' Postal Telegraph and Telephone administrations.

Observers say Burch is a man of high integrity who will restore the reputation of INTELSAT and the director general post. Burch's mandate will be to guide INTELSAT through an era of increasing competition in the international satellite arena, according to statements issued by INTELSAT.

Commenting on the appointment, Communications Satellite Corp. Chairman Irving Goldstein said, "Mr. Burch has demonstrated a clear understanding of the challenges facing INTELSAT, and he is an excellent choice to take charge of that organization and lead it through these difficult times." Burch is a partner and chairman of the Washington, D.C. law firm Pierson, Ball and Dowd, which he has been with since 1969. In 1985, he was named U.S. ambassador and head of the U.S. delegation to the World Administrative Radio Conference on Space in Geneva, Switzerland.

He served as FCC chairman from 1969 to 1974. Under his direction, the FCC initiated the first phase of telecommunications deregulation, implementing policy that allows consumers to purchase their own telephones and establishing rules to govern the emerging packet-switching value-added network business. ◻

US West from **page 13**

quired to form separate subsidiaries in order to sell customer premises equipment, which is nonregulated, as well as regulated network services.

The US West waiver became effective at the time of its approval, March 13, although a spokesman said the company has not yet implemented its joint marketing plans.

BellSouth is currently marketing customer premises equipment and network services such as Centrex to 50 large business accounts in the federal government, airline, banking and university markets as part of a pilot project, according to BellSouth spokesman Bill McCloskey.

Both RBHCs say joint marketing will allow them to compete more effectively with firms that offer one-stop shopping, such as Centel Corp.

US West's customer premises equipment and network services sales forces will remain separate, although they will make joint presentations to customers and jointly coordinate field operations personnel.

The separation between regulated and nonregulated activities will be maintained, and personnel will report to their current managers.

US West will submit a cost-allocation manual to the FCC. All costs incurred by the regulated network services unit will be charged to regulated accounts, and all CPE costs will be assigned to nonregulated accounts, in accordance with FCC cost-allocation rules. ◘

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Study from **page 13**

restrictions should be lifted must, according to the Modified Final Judgment, prove that: the BOC monopoly in the local exchange market has been eroded by substantial competition; BOC competitors no longer rely exclusively on BOC local facilities; and federal regulatory policies are capable of preventing improper BOC behavior. ETI applied those standards in critiquing the Huber Report.

Huber characterized the national public network as a geodesic dome in which switching capacity, and thus control over the network, is largely distributed among many carriers and end users. "The geodesic model provides a foundation for Huber's basic thesis, that the telecommunications marketplace is becoming less monopolistic and more competitive. It also supports his call for the elimination of structural and line-of-business constraints on dominant carriers," ETI said.

Blosser argued, "Huber's concept of the geodesic network is not a reality for the majority of the users the ICA represents."

ETI concluded that "none of the underpinnings of the original decree have changed significantly since divestiture, and the minor changes that have occurred are hardly sufficient to vacate the principles upon which the decree was founded." ETI pointed out that Huber estimated the BOCs' share of the local access market at 96% to 99%.

Huber's geodesic network concept is based on misconceptions about the manner in which telecommunications systems and networks operate, ETI said. "The centralized, hierarchical network that formed the basis of the historic monopoly is as entrenched as ever. Technological and economic developments may portend even stronger centralized BOC control over local exchange networks," Selwyn and Montgomery said.

Huber's conclusion that end-user private branch exchanges have given users control over the network and, consequently, taken the monopoly power away from the BOCs is false, ETI stated. Selwyn and Montgomery concluded that, while there may be sound reasons for modifying the current restrictions over time, the Huber Report does not contain an adequate exploration of the economic reasons for changing the decree. ◘

DATA DELIVERY

Trellis-coded 19.2K modem card out

Fujitsu America, Inc. claims to have developed the industry's first 19.2K bit/sec trellis-coded modem card. The card supports fall-back speeds of 9.6K-, 12K-, 14.4K- and 16.8K bit/sec. The product, which is designed for the OEM market, will be demonstrated this week at Interface '87 in Las Vegas, Nev.

Front-end processor features

Vendor	Hosts	Lines	Maximum main storage	Data type	Floor space	Price
IBM						
3725	6	256*	3M bytes	A/S	8.8 sq ft	$73K to $500K
3720	2	60**	2M bytes	A/S	4.7 sq ft	$29K to $117K
NCR Comten, Inc.						
5660	8	1,024	16M bytes	A/S	20.4 sq ft	$310K to $1,600K
3695	8	512	4M bytes	A/S	5.8 sq ft	$120K to $675K
3690L8	4	80	4M bytes	A/S	10.9 sq ft	$65K to $205K
5620	2	32	4M bytes	A/S	5.27 sq ft	$22K to $95K
Amdahl Corp.						
4705E	6	352	1 byte	A/S	9.6 sq ft	$45K to $200K
4705T	4	352	1 byte	—	9.3 sq ft	$45K to $200K
Lemcom Systems, Inc.***						
DNP	32	1,000	30M bytes	A/S	7.4 sq ft	$10K to $200K
Computer Consoles, Inc.						
CC-8	4	240	512K bytes	A/S	14.2 sq ft	$44K to $230K
CC-6	2	64	64K bytes	A/S	14.2 sq ft	$22K to $48K
CC-8400	4	8 links		A/S	9.3 sq ft	$50K to $150K
NTX Communications Corp.						
3800	2	4	96K bytes	S	5.0 sq ft	$160K to $240K

IBM's 3705 is no longer being marketed. With the release of the 3690L8 and 3695 in May 1986, the Comten 3650, 3670 and 3690 are no longer being marketed. Amdahl machines are manufactured by Japan's Fujitsu, Ltd., rebundled and marketed by Amdahl in the U.S. Floor space is a base configuration and does not include service clearance.

* Eight Token-Ring, 3,726 expansion unit — adds 160 lines to the 3725.

** Or 48 lines and two Token-Ring attachment three scanners.

*** One system (one box) contains several processors.

A - Asynchronous
S - Synchronous

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

▶ NATIONAL SCIENCE FOUNDATION

NSF T-1 net links schools

NASA, 5 Calif. universities joined.

BY MARY PETROSKY
West Coast Correspondent

SAN FRANCISCO — Five universities in the Bay Area here and the NASA Ames Research Center are being connected via T-1 links to create the highest speed regional network built to date under the auspices of the National Science Foundation (NSF).

The NSF is providing funding for the Bay Area Regional Research Network (BARRNET), which will provide the universities with access to supercomputer facilities, including the one at NASA Ames in Mountain View, Calif.

Stanford University and four University of California campuses — San Francisco, Berkeley, Davis and Santa Cruz — will be linked with NASA Ames on BARRNET.

NSF operates a nationwide network, known as NSFNET, that ties together supercomputer facilities and allows researchers to share information. BARRNET will provide a gateway into NSFNET.

In BARRNET, which is expected to be operational by the end of April, microwave equipment will be used for T-1 traffic between University of California, Berkeley and University of California, San

See **NSF** page 18

▶ DIAGNOSTICS

Infotron debuts six modems

BY PAUL KORZENIOWSKI
Senior Editor

CHERRY HILL, N.J. — Infotron Systems Corp. recently unveiled six diagnostic modems and enhanced a number of current products, including its network management system.

Infotron is reselling the new modems, and the company declined to identify the supplier. The products feature front-panel display for error rate tests, line and data terminal equipment loop-back tests and self-testing.

Two of the modems are designed for digital transmission and can be used as channel service units or data service units. The Inmodem 500 operates at speeds from 2,400 to 9.6K bit/sec over a standard subrate Dataphone Digital Service (DDS) channel. The Inmodem 556 operates at a speed of 56K bit/sec over a DDS channel or an unloaded four-wire leased line.

The other four analog modems operate over four-wire unconditioned private lines. The Inmodem 2400 operates at speeds of 1,200

See **Infotron** page 19

DATA DIALOGUE
PAUL KORZENIOWSKI

MAPping out a long-term strategy

Sometimes, users pay a high price for being technological leaders — the leading edge is often referred to as the bleeding edge. Technology can help a company get the upper hand on competitors, but in other cases, technology merely raises a company's operating costs.

Recently, articles in a number of publications have illustrated the challenges manufacturers are facing as they try to automate their factories.

A few weeks ago, *Business Week's* cover story recounted problems at General Motors Corp., problems that stem in large measure from the inability of automation to deliver promised cost reductions. In fact, *Business Week* claimed GM plants have gone from being the least to the most costly automobile plants to operate.

Digital Equipment Corp. President Ken Olsen has openly criticized GM's efforts to implement the Manufacturing Automation Protocol and stated that networking should remain the business of computer companies like DEC. In other arenas, users have criticized the limited benefits that MAP and other factory automation schemes have produced thus far.

It is true that automation and factory networking are not quickly implemented panaceas, but they may be victims of unrealistic expectations.

The concept of Computer-Integrated Manufacturing (CIM) was born in the early 1970s. CIM's premise was that automation could help manufacturers cut costs and increase production.

Achieving those goals has proven to be an arduous task, one that some companies were not prepared to undertake. Factory automation will take time. At least a few more years will pass before companies begin to see tangible benefits from CIM, for there are both technical and managerial obstacles that it must overcome.

The computer industry evolved for nearly 25 years before it began addressing the problems of connectivity. Vendors deliberately designed computers and networks so they could not easily talk with competitors' equipment.

Twenty-five years of work cannot be easily undone, and corporations have just begun to lay the groundwork for evolving to open network architectures.

Because manufacturers are charting unsailed waters, some have been pleasantly surprised at MAP's capabilities, while others have grown impatient with its limitations. As products conforming to MAP Version 3.0 become available, some limitations will disappear. But the road to complete factorywide connectivity is a long one, and users should not be fooled by vendor claims of a quick and easy fix for connectivity problems.

Managerial problems must also be overcome. Automating a factory involves more than installing cables and terminals.

Despite the recent rash of adverse publicity, the eventual success of factory automation and MAP seems guaranteed. After all, many of the world's largest manufacturers are backing work on the standards.

Still in doubt, though, is when the proposed benefits will begin to become evident and which companies have the patience and proper managerial organization to reap factory automation's rewards.

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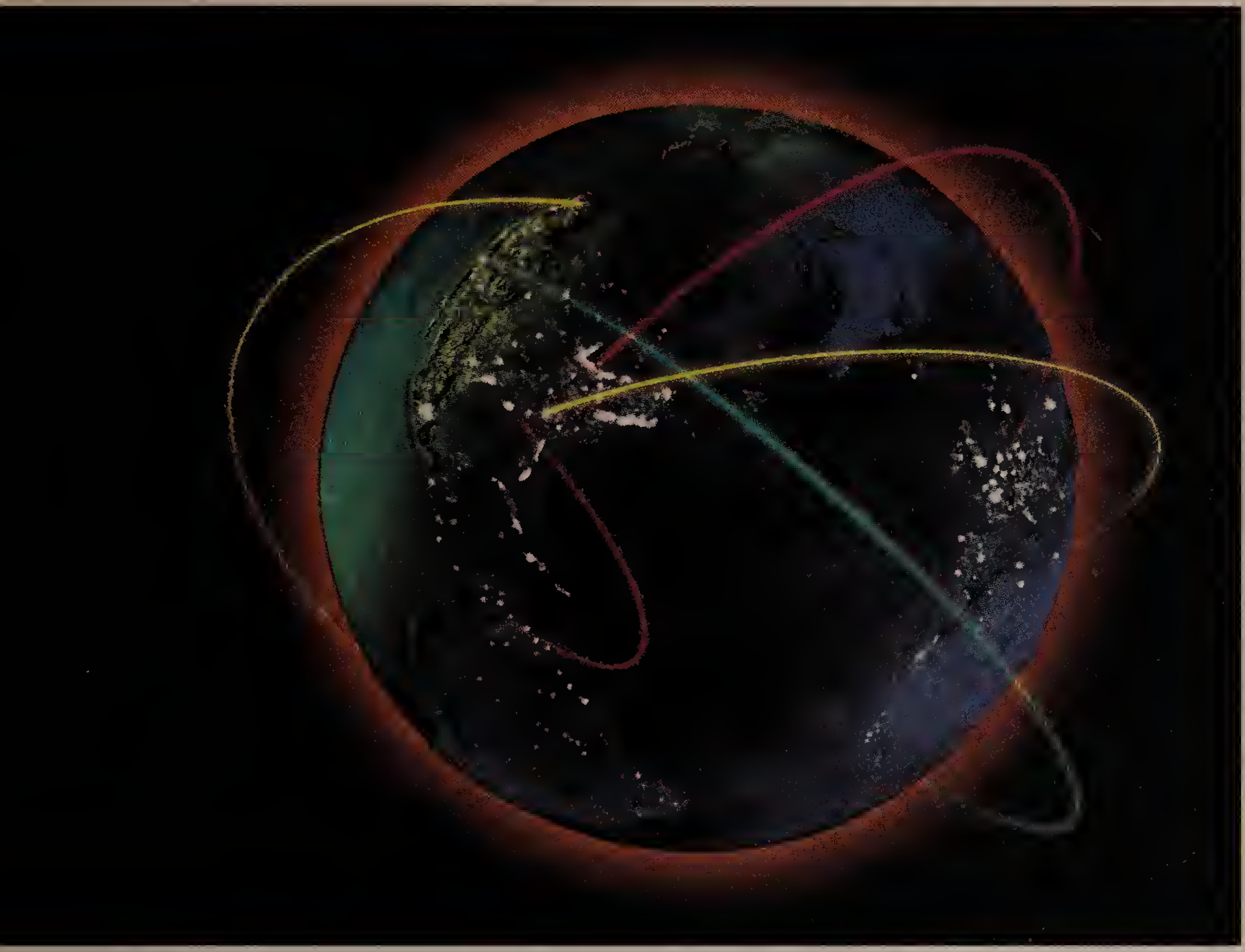

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NSF from **page 15**

Francisco. MCI Communications Corp. will provide a T-1 line between the Berkeley and Davis campuses — at roughly 60 miles, the longest link in the network — and Pacific Bell will provide T-1 lines between remaining facilities.

Dave Wasley, manager of data communications and network services at Berkeley, said the five T-1 connections linking the campuses will cost about $6,000 per month.

Currently, Berkeley shares a 112K bit/sec satellite link to the San Diego Supercomputer Center with several other institutions, Wasley said. BARRNET will initially access NSFNET through the San Diego center.

In addition to allowing more universities access to the San Diego facility, Wasley said he expects BARRNET will eventually support a higher speed link to the supercomputer.

Each university already has its own campuswide network, according to Wasley. These networks are primarily Ethernet-based, although Berkeley also has a Proteon, Inc. 80M bit/sec token-ring network in place.

Stanford and Berkeley each have more than 700 active network nodes, not including personal computers emulating terminals. The other universities have between 50 and 150 nodes, Wasley said.

The Transmission Control Protocol/Internet Protocol, which is already supported on most of the universities' campuswide networks, has been chosen by the NSF as the protocol suite for NSFNET. As a result, BARRNET will also support TCP/IP.

The satellite link to the San Diego Supercomputer Center currently does not support TCP/IP, so a higher speed, TCP/IP-compatible connection between NASA Ames and the center will be implemented in the future.

The NSF chose TCP/IP in large part because these protocols are used on the Department of Defense's research network, Advanced Research Projects Agency Network (ARPANET). ARPANET is currently acting as the NSFNET backbone, said Bill Yundt, director of networking systems at Stanford.

"The highest priority of NSFNET is to provide a communications infrastructure for the effective use of the supercomputer centers throughout the country in order to support scientific research and development in the U.S.," Yundt said.

He added that the participating universities "don't anticipate placing any limitations on the use of BARRNET." Electronic mail will likely be one of the most popular applications on the network, Wasley said. "The transfer of information is the lifeblood of a university," he said.

BARRNET differs from other NSF regional networks in that "we proposed to operate it as a clear channel T-1 from day one," Yundt said. "We want all 1.5M bits available to any one user."

The Bay Area universities justified using the higher bandwidth because the network will be accessing supercomputers. In addition to moving large files, speed was an issue because the universities anticipate graphics will be shipped around the network.

Although setting up the network itself is fairly staightforward, Yundt and Wasley both agreed that the routing of traffic through BARRNET is a challenging task.

"We have to be very, very careful in managing routing. There is a basic fire wall problem," Wasley said, referring to the need to keep problems on one school's network from affecting BARRNET.

The key issue is to prevent "bad" routing of information from a gateway on one university's network from being propagated throughout BARRNET, Wasley said.

Wasley cited a recent problem whereby a gate-

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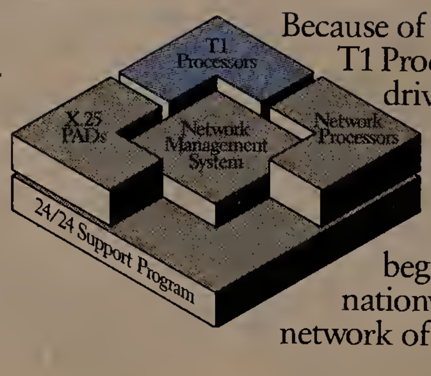

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way sent out messages indicating the data was routed to ARPANET. However, none of the data was transmitted because the gateway threw away the data.

In order to safeguard his campus network from another campus network's routing problems, Wasley said he wants a way to "pull the plug out" on a gateway if necessary.

Representatives of the universities spoke to three vendors before opting to use routing gateways from Proteon. "Proteon had the equipment that most closely met our needs, but we want to encourage multiple vendors to develop these," Wasley said.

Yundt said that Proteon's ability to deliver the gateways quickly was also a factor in choosing the vendor's product. ◻

Infotron from **page 15**

and 2,400 bit/sec; the Inmodem 4800 transmits at a speed of 4.8K bit/sec; the Inmodem 9600 operates at speeds of 4.8K, 7.2K and 9.6K bit/sec; and the Inmodem 14.4 supports transmission at 14.4K bit/sec.

Five of the modems work with quadrature amplitude modulation, and the Inmodem 14.4 uses trellis-coded modulation. Five models work with automatic adaptive equalization, and the Inmodem 556 supports automatic equalization. All the modems support serial, synchronous and binary data transmission.

Prices for the modems range from $1,795 to $6,100.

To control the modems, the company announced the INM Diagnostic Modem Controller, which works with out-of-band diagnostics. The network management system enables users to monitor, diagnose, manage and reconfigure networks from a central site. Also, a user can remotely configure modems, option settings and thresholds. The system's surveillance reports illustrate the performance of telephone circuits, terminal equipment and modems.

The INM Diagnostic Modem Controller supports up to 152 central-site ports and more than 6,000 remote drops. The unit transmits management information asynchronously on an out-of-band diagnostic channel. Restoral functions include hot spare-modem switching, dial backup, multiplexer reconfiguration, transmission downspeeding and remote multipoint bridging.

The INM Diagnostic Modem Controller sells for $17,000.

Infotron also enhanced its existing network management package, Integrated Network Manager (INM), so it can control the company's recently announced Infostream NX4600 and NX3000 network switches.

The company announced two models of the product, both of which are based on a workstation from Apollo Computer, Inc. An INM 400, which costs $38,000, can support up to 1,600 channels operating at 9.6K bit/sec, or 32 NX series nodes. The INM 1000, which sells for $48,000, supports up to 4,000 channels transmitting at 9.6K bit/sec, or 64 NX nodes.

Bob Bauer, vice-president of marketing at Infotron, said the company plans to integrate the INM Diagnostic Modem Controller with Infotron's current network management systems. Other enhancements include developing an interface to IBM's NetView network management system through IBM's NetView/PC, automatic generation of trouble tickets and enhanced security features.

The NX4600 and NX3000 switches, which were announced in February, mark Infotron's entry into the high end of the T-1 multiplexing market.

The NX4600 supports up to 96 T-1 lines and 4,000 channels, and the NX3000 supports four T-1 lines and 24 channels. The enhanced products support tandem switching, complete end-point configuration capability, dynamic bandwidth contention and adaptive differential pulse code modulation. ◻

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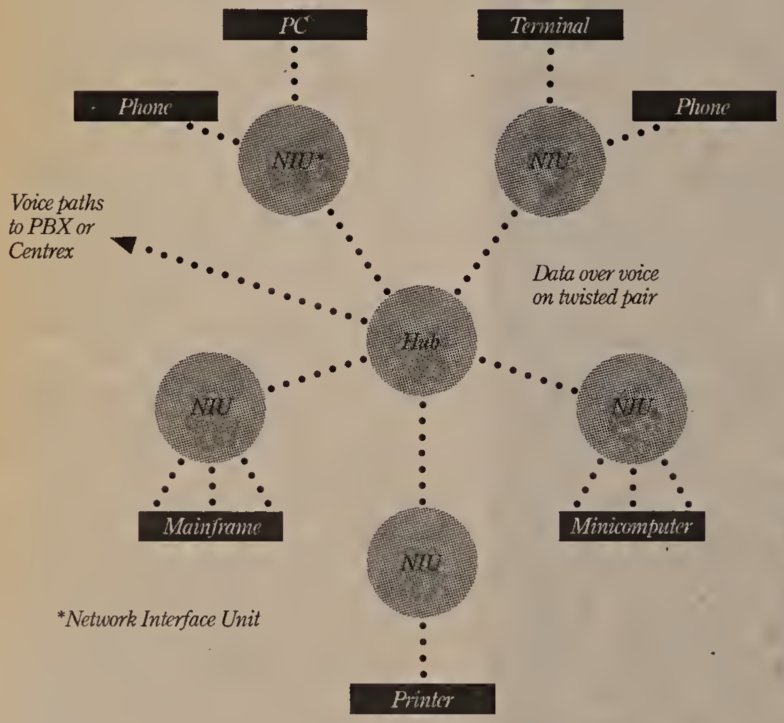

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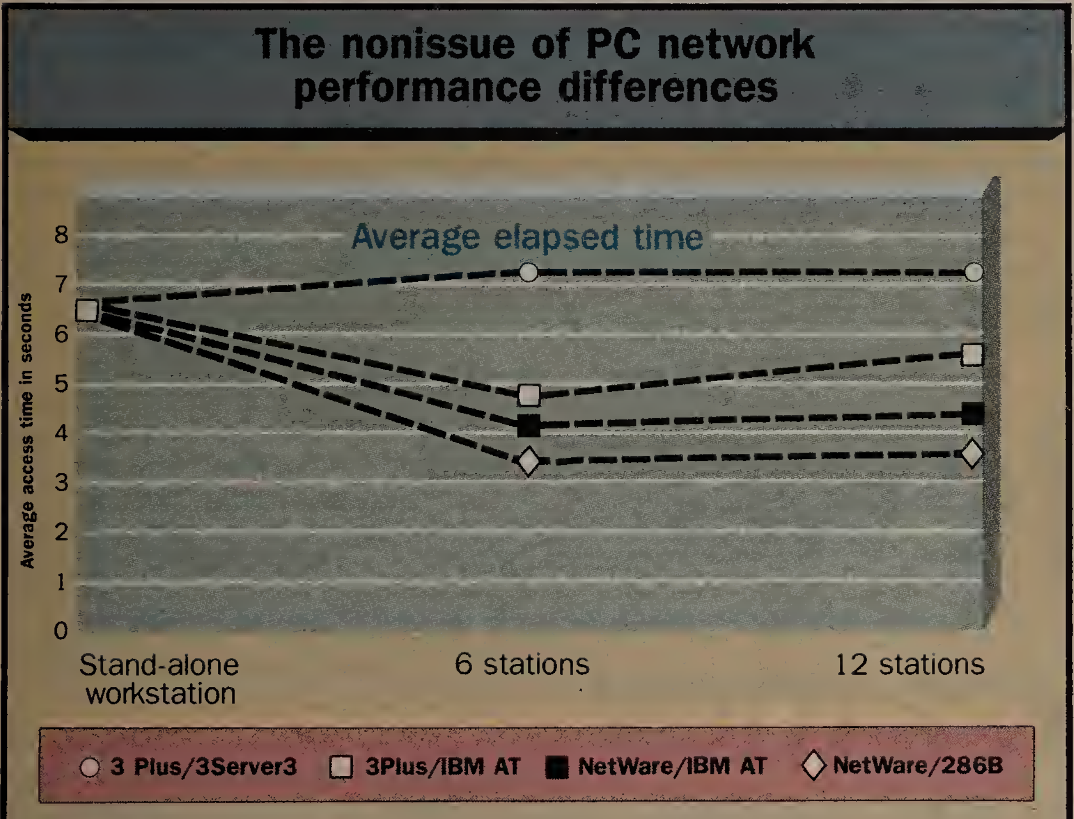
“Now is the right time for 3Com Corp. to come out with a diskless workstation. Before, people wanted that floppy drive. But 3Com's going into larger installations where buyers would rather not give end users local disk drives, and the end users themselves may not care whether they have the drives or not.

Gary Kwok
Manager of project consulting
Lanquest Group
Santa Clara, Calif.



The nonissue of PC network performance differences

The Seybold Group's office test of Novell, Inc. network servers vs. 3Com Corp. network servers found a 3½-second difference between each vendor's dedicated servers. In comparing networking software on IBM Personal Computer ATs, less than a one-second difference was found for a 6-node network and a 1½-second difference was found with 12 nodes.

SOURCE: THE SEYBOLD GROUP, SAN JOSE, CALIF.

▶ INTERVIEW

LAN caretaker tackles issues

Hitachi's Tim Ayres sees growing role for local net administrators.

As personal computer networks grow in size and in the applications they support, the network administrator is becoming more important and increasingly visible within an organization. End users turn to net administrators for advice on selecting local nets and help in implementing, maintaining and expanding the network.

Like many of his peers at other companies, Tim Ayres had no formal training to prepare him for the role of local net administrator. For Ayres, who oversees a 25-node personal computer network at Hitachi America, Ltd. in San Francisco, becoming a network administrator was a logical outgrowth of his involvement in the initial purchase of the network and the programming work he handled for the firm. Ayres, whose title is office

See **Caretaker** page 22

▶ WESTERN DIGITAL

Ethernet, Starlan net boards are fast, cheap

BY PAULA MUSICH
Senior Editor

IRVINE, Calif. — Western Digital Corp. recently announced personal computer interface boards for Ethernet and Starlan networks that are said to provide higher throughput at a lower cost than competitive products.

Both the StarCard Plus and the EtherCard Plus adapters use a common memory architecture to improve performance and keep costs down, Western Digital claimed. Both boards have an 8K-byte memory buffer that is shared by the processor and the adapter. The processor accesses this buffer directly without having to go through direct memory access (DMA) channels.

Most manufacturers have used DMA channels to link their network interfaces to microcomputers, according to Jack Landau, OEM marketing manager for Western Digital local-area network products. “DMA connections are actually slower on a 16-bit IBM Personal Computer AT than on a PC or XT,” Landau said. The performance improvements apply primarily to IBM Personal Computer ATs and compatibles.

Western Digital claimed its EtherCard Plus offers more than twice the performance of other Ethernet boards. According to Scott Haugdahl, senior systems specialist with Architecture Technology, a Minneapolis consultancy, Western Digital's EtherCard Plus adapter may provide better performance than adapters that use DMA channel access, but he questioned how it would stand up to microprocessor-based adapters. Haugdahl said the newer adapters that have their own processors, which aren't included in the Western Digital offerings, may be faster.

Price-wise, Western Digital's Ethernet board sets a new mark. At $399, the EtherCard is one of the lowest priced performance Ethernet adapters on the market, Haugdahl said. “This Ethernet adapter is going to put the squeeze on people like Ungermann-Bass, [Inc.] and 3Com [Corp.],” Haugdahl said.

While the StarCard Plus provides many of the same performance benefits, at $299, it is not priced as competitively as the EtherCard, Haugdahl said.

Novell, Inc., which is writing a driver, or networking software for the adapters, will soon offer an Ethernet adapter using this technique. The adapter will cost $495.

The Ethernet adapter is a half-slot board that connects to external standard Ethernet transceivers and directly to thin Ethernet cabling. Starcard Plus is primarily intended for use in file servers.

LANMARKS
PAULA MUSICH

Popping the local net expectation balloon

The difference between what first-time buyers of local networks expect of their networks and what they actually get can be drastic. In fact, the less the buyer knows about networking and the less research he does before buying, the greater the likelihood he will be disappointed.

With this in mind, the following list of what not to expect may help keep first-time buyers grounded in reality:

- Don't expect to install the net yourself unless you have lots of patience to contend with things like confusing directions. According to one industry executive, installing and configuring a local net is a black art. No one is really sure what the optimum configuration is.
- Don't count on your dealer's ability to install your network. While some dealers are qualified to install and maintain local nets, others aren't. Ask your dealer for names of their network customers. If the dealer measures up to task, be prepared to pay for their expertise.
- Don't expect your local network to run itself. According to some estimates, managing a personal computer net requires 20% of a full-time person's time. Others say that is a conservative estimate. Regardless, it is important to realize that networks take time and effort to maintain. Even maintenance contracts don't usually include things like backing up the server, answering user questions and adding new net users.
- Dont' expect the total cost of your network to equal the sum of the hardware, software, cabling and installation charges. One of the larger hidden network costs is time: the time it takes to train people to use, maintain and reconfigure the network.
- Don't expect people to work the same way after the network is installed. In sharing resources that were previously stand-alone, users need to change the way they do things. They need to become “network aware.” Users need to purge old files to keep server memory available for all users. As users realize productivity gains in a local network, they will use it more frequently, and others will want to access the network.

Caretaker from **page 21**

automation specialist, currently divides his time between maintaining the Novell, Inc./Proteon, Inc. network and managing Hitachi's information center.

The network, which has grown from six nodes in less than a year, is based on Proteon's ProNET-10 hardware and Novell's NetWare286 networking software. Two file servers, each supporting a local printer, allow clerical users, engineers and salespeople to share files, exchange electronic mail messages and run several multiuser applications.

The network also provides end users with access to a Hitachi mainframe on site. Information from the mainframe is downloaded to Cosmos, Inc.'s shared Revelation data base management system on the network servers. Users can then query the data, generate reports or run applications that use the mainframe data.

Network World *Senior Editor Paula Musich interviewed Ayres last week to learn what is involved in being a network administrator.*

What skills does a local network administrator need to do his job effectively?

You need a good working knowledge of the technical side of the network. You also have to be organized, and you need to be a good problem solver. My programming experience was helpful because I at least understood data processing concepts. I didn't know much about LAN technology, but it made it easier to catch on quickly. If we were to install the network again, I would make sure the administrator was thoroughly trained. I wouldn't put in the network and then go choose someone to maintain it, thinking that it was a very simple job. People don't seem to take LAN maintenance issues seriously until problems come up.

Network administrators who are also responsible for a company's microcomputers say networks simplify that task. Is that true for you?

Before we had the network, I was spending a lot of my time maintaining each individual PC. Now that we have the network, I load software once, and I have a centralized point of responsibility, which obviously saves me time. There's no way I could maintain 25 or 30 computers individually and still do the other things that I do.

What are your primary responsibilities?

Right now, I'm involved in things like assigning users logon identifications, managing the disk space on the servers and fixing any problems that have to do with the network. When there are network problems, like the printer isn't doing what you want it to do or you can't get into your PC, then I've got to be there to answer your questions.

What about end-user training?

End-user training used to be one of my responsibilities, but now we leave that up to other end users in the departments on the network. I don't have the time anymore, and it's become critical that they rely on other people. Now, there is a user or there are a few users in each department who seem to be more proficient than others on the network, and they generally introduce new users to the network.

What do you spend most of your time on?

Troubleshooting. That includes checking file usage statistics, capacity planning, checking disk space used or the efficiency of the network and running diagnostics to see where the bottlenecks are. For example, last week the network began to slow down. I had to find out why, using diagnostics that aren't that sophisticated. All they tell me is that packets are being sent and not being received. It doesn't say where or why. I'll have to study that to determine what I can do to speed up response time. In some cases, I have to take people off the network to try to isolate areas and hunt those problems down.

Are the diagnostic tools available to local network managers inadequate?

For Novell networks, there aren't many diagnostic tools. There are a few third-party products, but they're either prohibitively expensive or they really don't quite do what we need them to do. They don't really address the problems we're faced with.

After managing the network for more than a year, do you feel like an expert?

I'm at a plateau in my learning curve. I understand, in a general sense, how the network works. I understand all the concepts, where everything is physically and how it relates to things logically. I also understand the network maintenance issues. But I don't know enough about the hardware itself. It would be great to take all the courses Proteon offers, but I don't have the time because of my other responsibilities. I have to take a more general view and hire people to solve the problems I can't.

Network News

March 1987

ARC UNVEILS NEW GENERATION OF PROTOCOL ANALYZERS

The new INTERVIEW 7000 series protocol analyzers test ISDN, T1, SNA, X.25, BISYNC and other protocols in product design, certification, network control and manufacturing applications.

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Each unit has two 1.4 Mega-byte (formatted) micro-disk drives, a space saving plasma display and cost saving surface mount technology. The INTERVIEW 7500 operates at speeds up to 256 Kbps and has a large 20 Mega-byte internal disk for data and program storage.

ARC adds four new hand-held testers to its product line

ARC's data comm test equipment product line is expanded again by the addition of four, low cost, multifunction test instruments.

The new INTERVIEW® 5 Plus, 10 Plus and 15 Plus feature integral 1 Mega-byte floppy disks for storing programs and data, in a compact package weighing less than 5 pounds. The fourth unit, the INTERVIEW 5 offers 32 Kbyte capture RAM in a 3 pound package. These testers can capture data at speeds up to 72 Kbps.

ARC's Network Management Systems rated Number One

In an independent survey* of large sites in the U.S., ARC's Network Management Systems were ranked number one in the industry for ease-of-use, generation of reports, overall reliability, restoral capability, traffic rerouting capability and vendor support.

*November 1986 survey conducted by The Market Information Center, Inc.

New system offers flexible, automated dial backup for multi-drop circuits

ARC's fully automated Multi-Line Dial Backup System controls and restores service for multi-drop or point-to-point circuits. This new system replaces a combination of VF bridges, patch panels, DAAs and any other equipment needed to perform DDD backup on multi-drop circuits.

DDD backup circuits may be dedicated or shared automatically, reducing line costs. Line quality is assured with local or remote diagnostic tests performed on analog lines before cutover.

This modular system can be expanded to handle up to 512 leased lines and is compatible with ARC's Network Management Systems.

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COMMUNICATIONS MANAGER

> “There are courses in computers and courses in communications, but I challenge you to find a course anywhere that marries them.
>
> **Ivan Frisch**
> Director of technical programs
> Polytechnic University Center for
> Advanced Technology in Telecommunications

The telecommunications manager: then and now

1970s

- Less flexible to alternative technologies
- Did not consider telecommunications as strategic corporate weapon
- One vendor relationship limited negotiation options
- Technically oriented, preoccupied with equipment
- Reported to vice-president of administration or office services

Late 1980s

- Identifies telecommunications implications in business programs
- Knows costs and risks of alternative approaches
- Strong interpersonal skills
- Participates in corporate strategic planning
- Reports to executive vice-president of operations, chief financial officer

SOURCE: HALBRECHT ASOCIATES, INC., STAMFORD, CONN.

▶ COMPUTERS/COMMUNICATIONS

School offers joint technology degree

BY BOB HAMEL
Senior Editor

NEW YORK — Polytechnic University recently announced its intention to offer this fall what it believes is the first master's degree program to combine computer and telecommunications curricula.

Ivan Frisch, who was recently named director of technical programs at the university's Center for Advanced Technology in Telecommunications, said existing courses will be modified, and new courses will be offered that are designed to combine studies in computer and communications technology.

One course in Information Systems Engineering, for example, will integrate the treatment of computer operating systems and network protocols.

"The program is intended for people who are professional telecommunications network and systems designers, people who have been trained in either computing or telecommunications, but not in both," Frisch said.

Program requirements

He said the requirements for participating in the program include an undergraduate degree in engineering, computer science or equivalent on-the-job experience.

"It's a technical career program, intended for the implementer — the designer more than the manager."

The two-year Information Systems Engineering program is designed for corporate-sponsored participants, who will attend classes every other Friday and Saturday.

Frisch considers the program, which he said he hopes will begin this September, to be an accelerated method of the "job-rotation" training generally

See **Degree** page 25

▶ ENTELEC '87

Energy firms seek aid in paring costs

BY BOB HAMEL
Senior Editor

HOUSTON — In search of new ways to control communications costs, more than 2,000 communications professionals representing companies in the North American oil and gas industry gathered here recently for the Energy Telecommunications and Electrical Association's (ENTELEC) annual meeting.

As prices have declined over the past year, energy firms have struggled with falling revenues, and they have been forced to find ways to keep expenditures in line. Communications managers at many of those companies came to ENTELEC for help in improving the effectiveness of their communications systems and to find new cost-saving network applications.

Al Meyer, a communications coordinator for the Clajon Gas Co. of Giddings, Texas, said he, like his peers at the conference, "wanted to find out how to get more bang for the buck" out of existing communications systems.

Dave Bailey, a manager of information and technology services for ARCO Pipe Line Co. of Independence, Kan., concurred. Bailey, a 25-year show veteran, said his concerns are "making my communications systems more efficient, if not faster."

One of the presenters, Fred Meisner, an engineer in gas control and measurement with Nova, an Edmonton, Alberta-based corporation, said attendees at ENTELEC fell into two camps. "There are the technical bits and bytes people, checking out the new hardware and software technology, the new multiplexers and such; and the management people, looking for cost-reduction applications."

Bernie Toupin, a communications coordinator for the Texas Pipe Line Co., and four-time ENTELEC attendee, fell into both categories. Toupin said he keeps coming back to the conference to get practical voice and data product information for his field representatives.

"Once I get back, my phone will be ringing off the hook," he said, adding that his field representatives will be questioning him on new products and applications that they have heard about. Toupin considers the show valuable because "you get straight answers here."

Unlike representatives from most other companies, Steve Martz, an electrical applications engineer for ANR Pipeline Co. of Detroit, indicated that, with cutbacks in travel expenses, "our company thought it was important to send only the people with responsibilities in maintaining the communications systems to the show."

A representative of one of the larger

See **ENTELEC** page 25

GUIDELINES
BOB HAMEL

Practicing the art of negotiation

The communications manager negotiates daily with upper management to determine corporate telecommunications strategies, and with peers and subordinates to enact those strategies harmoniously.

One of a manager's most important negotiating responsibilities is dealing with vendors for equipment and services.

Many people believe that only one side, either the company or the vendor, benefits in negotiations, while the other gets ripped off. But that doesn't have to be the case. Successful negotiation is often a matter of both sides conceding issues to each other so that both may benefit. Keeping in mind the points below could make negotiating easier:

- Before dealing with a vendor, understand what features and services are absolutely required. These are sacrosanct and cannot be negotiated. A well-defined request for proposal will spell out those key product requirements and will identify less important, negotiable features. If a vendor cannot meet a key requirement, there is really no reason to continue negotiating. If the vendor can meet those requirements, there's room to haggle over price and other items.
- Use competition to your bargaining advantage. With deregulation, there is a plethora of vendors willing to bid for business. Reminding the vendor of this can strengthen the company's position.
- Ask questions about the status of product features, including whether those features are actually being shipped. Ask for the names of customers using the features.
- During contract negotiations, concede grudgingly and in small amounts. A number of small concessions can often avoid a major concession.
- If something is important to you, don't give it up or you may be sorry later. A vendor who is eager to build a long-term relationship will recognize your resolve.
- Be willing to compromise on smaller items. If you are unyielding on minor points, you may turn away a vendor that really wants to serve you, or a vendor may agree to stipulations it will have trouble meeting.

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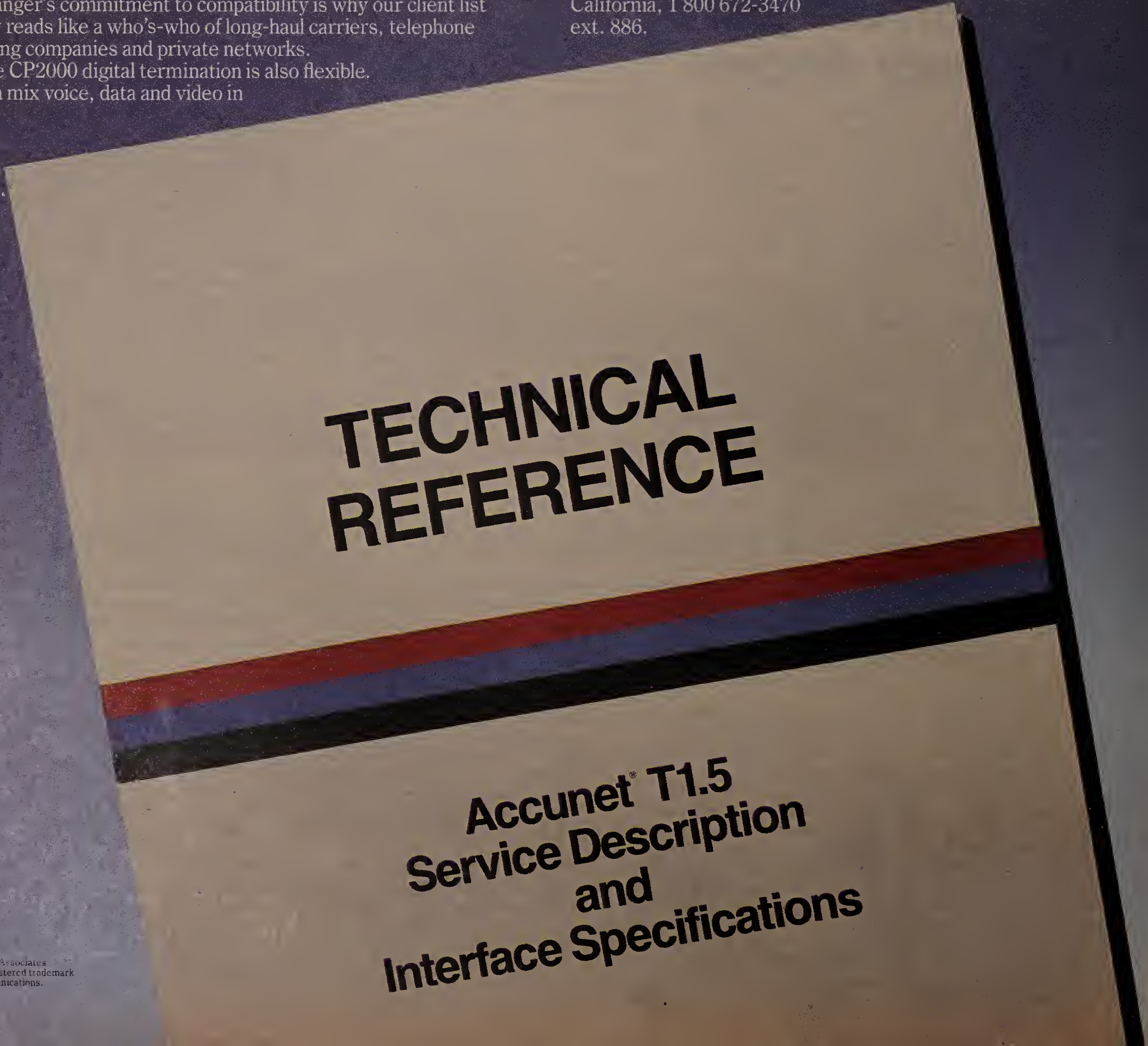

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ENTELEC from **page 23**

vendors exhibiting at the show, Contel ASC — formerly American Satellite Corp.— agreed with Meisner.

Jim Riley, a commercial sales representative with Contel ASC, said attendees were looking for ways to save money by making communications more efficient. "It's a fact of life in the industry," he said. "The pipeline companies have to save where they can."

Earlier in the year, continual financial problems forced the group to shift the site of this year's conference from Denver to Houston. A majority of the members' companies have their headquarters in the Houston and Dallas areas. The shift of venue was intended to help keep travel expenses in line.

ENTELEC, formed in 1926, is the second oldest communications users group in the U.S., according to Loyce Hurley, a past president of the association. Hurley said the group was formed by 14 men in the petroleum industry in Ft. Worth, Texas, who wanted to improve their telegraph systems.

Originally called the Petroleum Industry Electrical Association, the members "used the meetings to trade information and help one another solve problems with their telegraph equipment," Hurley said. As the organization grew, its focus shifted to telecommunications and data communications, and in 1978, the organization was given the name ENTELEC.

Wil Rathke, current president of the association, said its purpose is still to educate members in the uses of new technology. "The association prides itself on being, first and foremost, an outlet for education," Rathke said.

Technical presentations given at the conference covered topics in such areas as Supervisory Control and Data Acquisition (SCADA), integrating voice and data communications systems, microwave and radio/cellular communications. SCADA systems are communications systems used to remotely control and monitor the flow of product through the pipelines.

Not surprisingly, users seemed most interested in exhibits and sessions on SCADA technology, which can help them make more efficient use of their companies' pipeline systems.

Jim Ivy of Trunkline Gas Co. in Dyesburg, Tenn., and a veteran of ENTELEC shows, noted the great importance computerization has played in the industry. "What was once a strictly pipeline hardware and equipment show is becoming very computer-based," he said. "When one company computerized, it forced the other vendors to." ◘

Degree from **page 23**

used by major corporations. "What most people get in training in six years' time by rotating jobs within a corporation, we will be able to provide in a two-year time frame," he said.

Frisch noted that in the past, institutions kept computer and communications curricula separate. By combining them into one course, he said he thinks students will learn how to guarantee that information is transmitted correctly, with relatively low error rates in complex information systems.

As a classic example, Frisch cited installing a transaction processing system for a brokerage house.

"You can't separate telecommunications from computing. An overall application has to be served, and what is needed is someone who can look at the entire application end to end."

Frisch said the mix of participants will come from vendor and user corporations. For further information, contact Polytechnic University at (718) 643-8035. ◘

ASSOCIATIONS

The International Communications Association (ICA) will hold its second five-day "T-1 and Multiplexing" session, June 14 through 19 during its summer program at the University of Colorado at Boulder. The ICA recommends the program for new telecommunications managers with limited hands-on experience in T-1 technology or telecommunications managers who require more familiarity with the technology.

Such topics as the concepts and media characteristics of T-1 will be covered in lectures, and T-1 network hardware will be examined in demonstration labs. Hands-on applications will comprise more than 50% of the scheduled activities.

In addition, T-1 multiplexer concepts, justification and selection will be covered, followed by T-1 circuit engineering, carrier formats and multiplexer networking. The economics and future of T-1 round out the week's sessions.

Last year marked the first such effort by ICA. Because of the success of the venture, the program is once again being offered.

Registration for the session is $850 and includes campus housing. For additional information, contact Robert Eilers at (214) 233-3889. ◘

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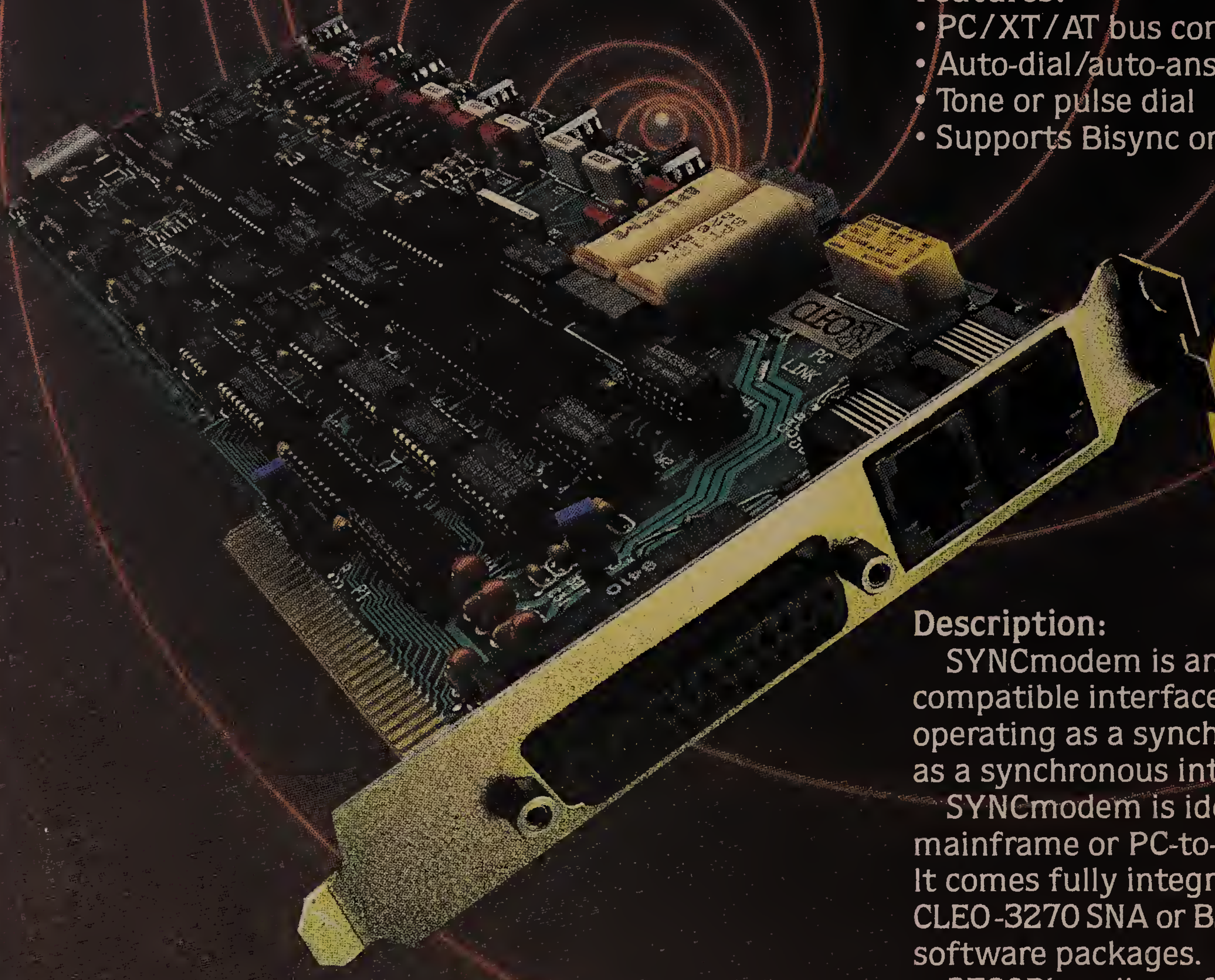

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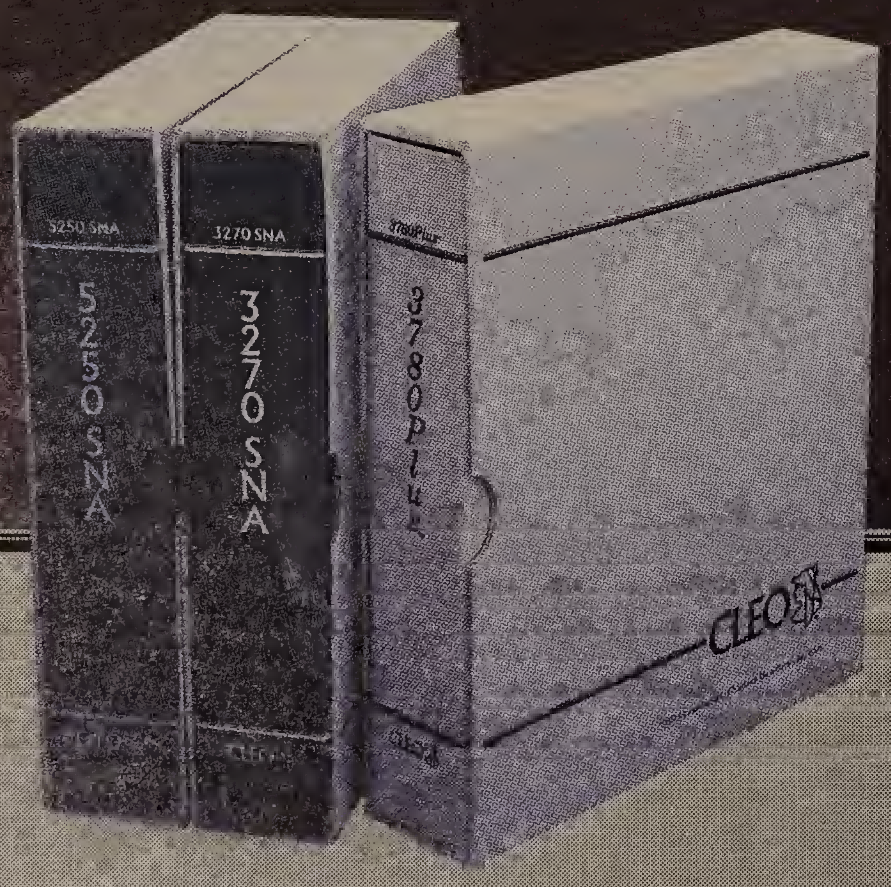

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NEW PRODUCTS AND SERVICES

See inside for:
- ▶Northern Telecom phones
- ▶LAN-mainframe link
- ▶Okidata 9.6K bit/sec modem

▶ MULTIPLEXERS

Infinet unveils stat mux group

BY JIM BROWN
New Products Editor

NORTH ANDOVER, Mass. — Infinet, Inc. last week introduced four integrated statistical multiplexers (ISM), including two that multiplex terminal data and feed into two others, which can serve as backbone network processors.

According to the firm, the ISM 300 series and the ISM 600 series nodes can be configured to feed multiplexed data into ISM 700 or ISM 900 nodes. These, in turn, will then concentrate those lines and switch connections between as many as 15 host links operating at 19.2K bit/sec or eight host links operating at 56K bit/sec.

The entry-level ISM 300 series multiplexes four or eight asynchronous data channels operating at up to 9.6K bit/sec onto a single 19.2K bit/sec synchronous link. The ISM 600 series accepts data from up to 32 asynchronous or synchronous channels operating at up to 9.6K bit/sec. It multiplexes them over a single 19.2K bit/sec link or one of two 9.6K bit/sec links. The ISM 600 series will support dual-link load balancing. It will also drop and insert data in multiple-site configurations, switch terminals between hosts and support host port contention and alternate routing in ring configurations.

The firm's dual-purpose ISM 700 series and ISM 900 series combine data from up to 640 channels onto up to 15 19.2K bit/sec, 15 72K bit/sec or eight 56K bit/sec host links. The ISM 700 series accepts input at up to 9.6K bit/sec, while the ISM 900 series accepts speeds of 19.2K bit/sec. Both the ISM 700 series and ISM 900 series offer central-site nodes with redundant logic and power control.

In a data concentration environment, the ISM 700 combines the aggregate links of several ISM 300 series and ISM 600 series multiplexers to consolidate a number of central-site multiplexers into one unit. It also allows the operator of a console attached to the central-site node to reroute data traffic to avoid downed lines in a multinode network.

Designed for central and hub sites, the ISM 900 series serves as a network concentrator and processor. It routes data over the shortest and least-congested path to the host. A network of up to 64 ISM 900 series nodes will support tandem switching, alternate routing, and it will emulate IBM Binary Synchronous Communications polling procedures.

Both the ISM 700 series and ISM 900 series will record network events and alarms as well as perform diagnostics that troubleshoot both the high-speed links and channels. Testing and monitoring is performed from the console attached to the central-site node. That console can also be used to configure each node's operating parameters and then to download those configurations.

All four products employ cyclic redundancy checking and automatic request-for-retransmission error-checking, as well as automatic baud-rate detection, which adjusts the unit to the incoming data line speed. The units also support RS-232-C and V.24/28 interfaces.

Infinet, a division of Montreal-based Momotec Data, Inc., said the products will be manufactured by Infotron Systems Corp., Cherry Hill, N.J. Pricing for the ISM 300 series starts at $1,450. The ISM 600 series starts at $1,900. The ISM 700 series starts at $4,800, and the ISM 900 series starts at $9,800.

Products & Services

Two software packages allow IBM/DEC emulation

Interlink Computer Sciences, Inc. has released two host-resident software packages that enable IBM terminals to emulate Digital Equipment Corp. terminals, and vice versa.

Residing on an IBM mainframe, the firm's **327X Emulation** package allows IBM terminals to emulate DEC VT-100 or VT-220 terminals accessing DEC VAX minicomputer applications such as DEC's All-in-1. The **VT-XXX Emulation** package, residing on a DEC VAX, allows a VT-100 or VT-220 to access VTAM applications running in an IBM Systems Network Architecture environment as if it were an IBM 3278 Information Display Terminal or IBM Logical Unit Type 2.

Both packages feature a programmable soft key function that allows up to 27 keys to store preprogrammed routines such as log-on procedures. They work with the firm's 3711/S Gateway, which connects IBM SNA mainframes to a DECnet network.

Early versions of the packages are being shipped to 3711/S Gateway users who preordered them. The packages are otherwise generally available. The 327X Emulator package is priced at $5,950, and the VT-XXX package is priced at $10,950.

Interlink Computer Sciences, Inc. is located at 47370 Fremont Blvd., Fremont, Calif. 94538 (415) 657-9800.

BSC-to-SNA device enhanced

NetLink, Inc. enhanced its SNA—Gate, which converts Binary Synchronous Communications protocols to IBM Systems Network Architecture protocols.

The SNA—Gate Model 1B concentrates and converts up to eight BSC lines hooked to the device either directly or over leased, multidrop or dial-up connections. The enhancements will enable the SNA—Gate Model 1B to provide two host links operating at 9.6K bit/sec or six host links operating at 4.8K bit/sec.

Users can customize the unit to accept the BSC protocols used in IBM 3275 terminals, IBM 3274 cluster controllers, IBM 3271 cluster controllers and IBM 2780/3780 remote job entry terminals.

The enhanced SNA—Gate Model 1B costs $4,500.

NetLink also dropped the starting price for its SNA—Gate Model 1, which converts both BSC and asynchronous protocols to SNA, from $7,500 to $6,000. The starting price of the SNA—Gate Model 1A, which converts asynchronous protocols to SNA, decreased from $4,500 to $4,000.

NetLink, Inc. 3214 Spring Forest Road, Raleigh, N.C. 27604 (919) 878-8612.

▶ PACKET SWITCHING

BBN aims at low-end X.25 mart

Products debut at Interface '87.

BY JIM BROWN
New Products Editor

LAS VEGAS, Nev. — BBN Communications Corp. is expected to release entry-level X.25 packet-switching products at the Interface '87 conference starting here today.

Targeted at small to mid-sized customers or those just beginning to build X.25 private packet networks, the products include a packet-switching node, a multiple protocol packet assembler/disassembler and a small-scale version of BBN's network management system.

The firm's C/3 Packet Switching Node (PSN) has the same features as BBN's larger C/30 and C/300 PSNs and is software-compatible with those larger units. The desktop or rack-mountable switch has 12 ports — 10 supporting speeds up to 19.2K bit/sec and two supporting 64K bit/sec links.

According to BBN, the unit will switch 125 packets per second when configured as an access device and 300 packets per second when configured for tandem switching. The switch's software and configuration file is accessed from BBN's Network Operations Center (NOC) network management system. Now entering beta testing, the C/3 is expected to cost $19,000 when available in October.

The firm's Advanced C/10 Multi Protocol PAD converts asynchronous, Binary Synchronous Communications and Systems Network Architecture/Synchronous Data Link Control protocols into X.25. The unit supports up to eight line cards, each of which is capable of supporting either eight asynchronous devices or four synchronous devices.

The device will support incoming speeds of 9.6K bit/sec and a single link speed of 19.2K bit/sec. A dual-link option provides a pair of 56K bit/sec links to a remote switch.

Compatible with IBM's Network Control Program Packet Switching Interface, the device will accept asynchronous protocols compliant with CCITT X.3, X.28 and X.29 standards, as well as HASP and

See **BBN** page 31

“It’s easy to get the
to play together,

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players. Gettin'em that's the hard part."

Unity from NEC: Casey would have called it, "Amazin'!"

If Casey had managed information instead of a baseball team, he'd have looked to NEC for help. Because at NEC we recognize that building the most productive business takes more than computers and communications working alone. You need them working together.

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Its voice, text, image and data capabilities allow you to build a system to your own design.

Voice and data capabilities are further enhanced when you connect the NEAX 2400 IMS to D$^{\text{term}}$ digital telephones and the exciting APC IV computer—add to this our intelligent BIT Series of fax terminals and suddenly everything in your office starts to play together better than ever before. And the APC IV, with its perfect blend of compatibility and power, can run all the most popular software.

Every NEC product is a strong individual performer. Working together, they're even better. And they also interface smoothly with other suppliers' equipment, so it's easy to form the exact system you need.

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Products & Services

Northern Telecom releases new phones

Northern Telecom, Inc. announced an enhanced telephone console for central answering positions and a new hands-free telephone.

The **Unity Controller** is designed for operators in small businesses or departments of large businesses. Compatible with Centrex and private branch exchanges, it supports up to three incoming lines and has 15 programmable buttons for direct station selection or access to telephone system features.

The telephone features link, hold and release buttons. With the optional Unity Add-on Module, which provides an additional 20 programmable buttons, the console will support up to 35 station or feature access buttons.

Also released was the **Unity VII**, a business telephone with integrated speakerphone. In addition to its stand-alone ability, the Unity VII is compatible with Centrex, private branch exchanges and key systems. It has eight fully programmable buttons as well as link and line release buttons.

The telephone also has select and last-number redial as well as a battery-backup memory, which retains stored information for up to 72 hours. In addition, it features on-hook dialing and message-waiting indication.

The Unity Controller costs $463. The Unity VII is priced at $237.

Northern Telecom, Inc., 200 Athens Way, Nashville, Tenn. 37228 (615) 734-4576.

Package connects LAN users to mainframe

Waterloo Microsystems, Inc. released a package that allows personal computers attached to its Port local-area network to share a single connection with an IBM mainframe.

The **Port IRMA Server** operates in the random access memory of an IBM Personal Computer or compatible attached to a mainframe over a Digital Communications Associates, Inc. IRMA board.

Using the Control Unit Terminal configuration, other Port-connected personal computers can access the IRMA board through the IRMA Server software. The IRMA Server package makes the Port-connected personal computer look like an IBM 3278 terminal to the host and allows the personal computer to print documents on any network printer.

It can also transfer files between the personal computer and the mainframe.

The firm's memory expansion board, the Port VRAM card, can be used to run the IRMA Server package, thereby freeing the personal computer's own RAM for processing other applications.

The Port IRMA Server package costs $995. A Port VRAM card with 512K bytes of memory costs $695, while a 1M-byte version costs $995.

Waterloo Microsystems, Inc., 3597 Parkway Lane, Suite 200, Norcross, Ga. 30092 (404) 441-9252.

Okidata unveils 9.6K bit/sec modem

Okidata introduced a CCITT V.29-compliant 9.6K bit/sec synchronous modem.

The **CLX96DP** operates in half-duplex mode on dial-up lines and in either half- or full-duplex mode on dedicated lines. The unit features automatic adaptive line equalization and will automatically adjust to the line signal level to prevent data distortion.

The modem includes built-in diagnostics such as local and remote analog and digital loop-back tests. A CCITT V.52-compliant 511-bit pattern generator built into the modem can be used in conjunction with loop-back tests to permit testing of an entire communications link.

The modem has a single-card design to improve reliability. According to Okidata, mean time between failures is more than 40,000 hours.

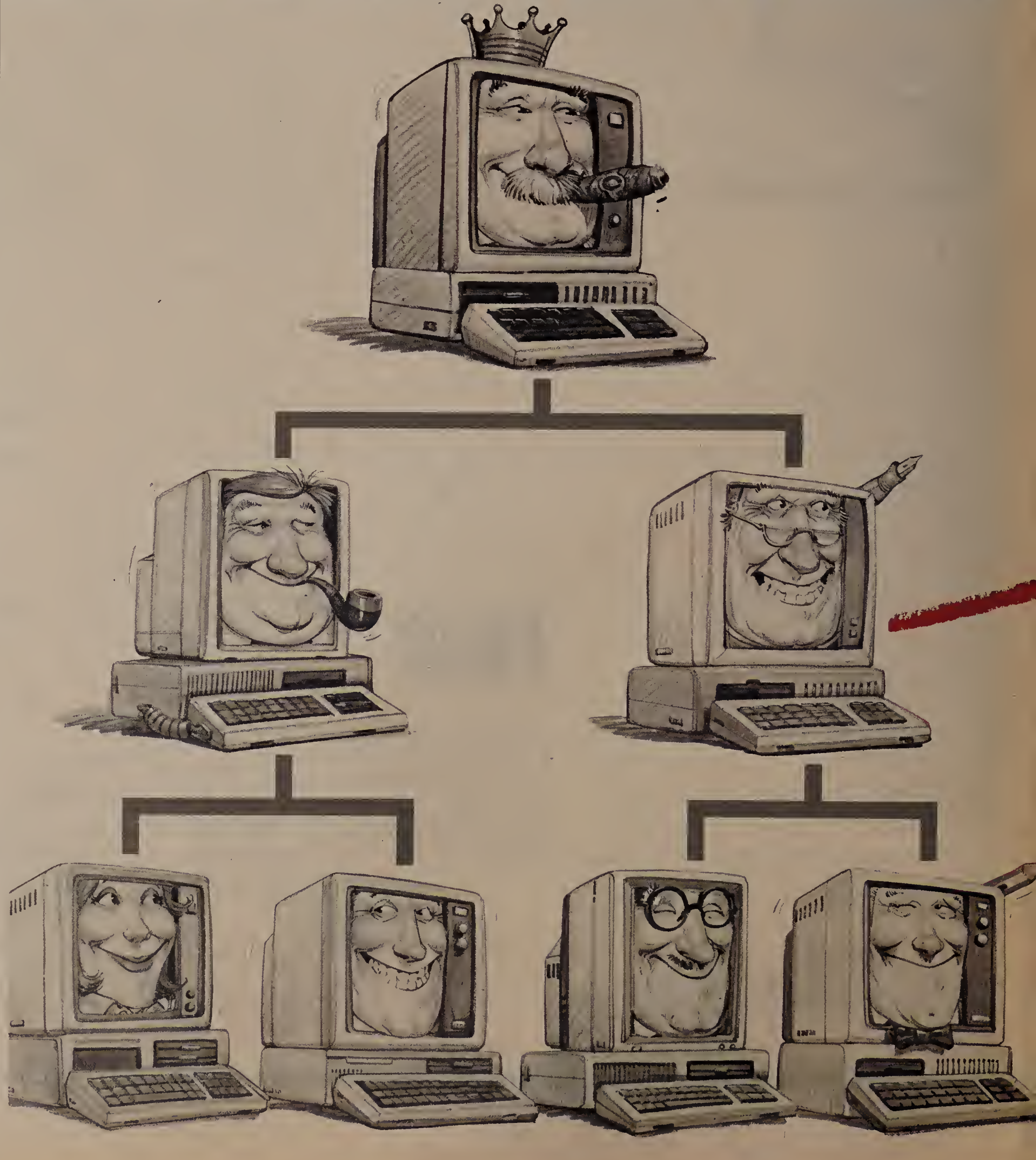
The CLX96DP is priced at $1,495.

Okidata, an OKI America company, 532 Fellowship Road, Mount Laurel, N.J. 08054 (609) 235-2600.

Firm enhances modem offerings

Racal-Vadic, Inc. added a call-back security system to its MDS-II modem network management system and enhanced its 2,400 bit/sec

Crosstalk Network
Because Networks



Products & Services

modem offering.

The new three-level security feature, dubbed the **VA930,** intercepts modem calls to the host computer, providing access to authorized users only.

The three levels of security are: standard callback, which dials back stored telephone numbers; programmed callback, which serves traveling users by dialing back a number specified during an initial call-in; and pass-through access, which connects users directly.

The VA930 supports 30 of the firm's MDS-II modem network management systems and will support up to 2,000 users in a corporate dial-up network security data base. The VA930 will also provide an audit trail, summary statistics and security alarm records, which can be printed either locally or remotely.

Unauthorized access attempts are monitored and signaled by alarms. Local or remote network managers can connect to a remote VA930 to edit the security data base, add or delete modems from the callback group, or modify system parameters.

The VA930 package, which includes a security card, printer cable and manual, is priced at $2,995.

Racal-Vadic also enhanced its 2,400 bit/sec modem, called the **2400PA Model 2,** to include an eight-character LCD display, front-panel control switches, a built-in speaker, multiprotocol autodialer and compatibility with a Hayes Microcomputer Products, Inc. AT Plus command set.

The 2400PA Model 2 will be available in April and will be priced at $795.

Racal-Vadic, Inc., 1525 McCarthy Blvd., Milpitas, Calif. 95035 (408) 946-2227.

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Any network user can exchange files with a wide variety of other PCs, PC Networks, minicomputers and mainframes, including information utilities.

They can exchange files peer-to-peer within the network, at very high speed, without the need to go through the server.

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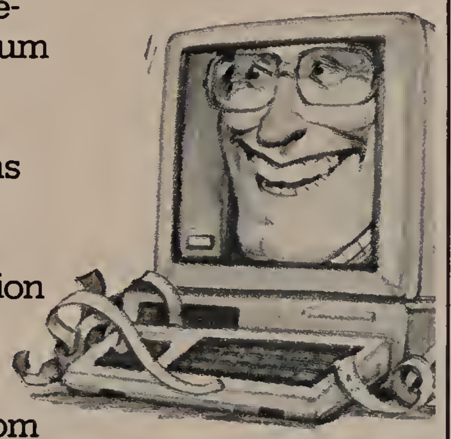

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System multiplexes four T-1 links

American Photonics, Inc. introduced a T-carrier fiber-optic system designed to multiplex and transmit up to four T-1 lines over a single fiber-optic cable in local-loop applications.

The **API T-carrier Fiber Optic Transmission System** provides transmission between voice channel banks, digital private branch exchanges, data multiplexers and other T-1-compatible equipment. The system's three elements include: a pair of the firm's DL1120 fiber-optic modems; the firm's AFM4500 multiplexer, designed to combine up to four independently timed T-1 channels onto a single link; and the SW1000 hot standby protection switch, which senses signal degradation from either the modem or multiplexer and provides an alternate route.

The multiplexer also provides a control channel that transmits network alerts between sites and an additional voice channel, which establishes a direct telephone link between the two sites. The telephones attach to the multiplexer over RS-422 links.

Pricing starts at $2,500.

American Photonics, Inc., 71 Commerce Drive, Brookfield Center, Conn. 06805 (203) 775-8950. ◘

BBN from **page 27**

IBM's SDLC, 3270, 2780 and 3780 protocols. The device will also be able to be configured from the central site NOC.

The Advanced C/10 Multi Protocol PAD, supporting a minimum of two protocols, is expected to sell for $9,350. It will be available in July. The dual-link option is priced at $3,000.

BBN's C/7 NOC is a small-scale version of the company's C/70 system. It will monitor, control and configure up to 16 C/3 PSNs or a mix of other PSNs. Housed in a 62-in.-high cabinet, the C/7 collects data on network device status and circuit conditions. That information is displayed on a directly attached Digital Equipment Corp. VT-100-compatible terminal in real time. The C/7 will also distribute network configuration changes and software updates from a central site.

The C/7 can be upgraded to a C/70. It will also support attachment of two BBN NOC Workstations, which is a $24,000 device based on an IBM Personal Computer AT with color monitor that displays geographic and logical maps of the network.

Available in May for $125,000, the C/7 comes with a 340M-byte Winchester disk drive, a magnetic tape drive and network management software.

A subsidiary of Bolt Beranek and Newman, Inc., BBN Communications Corp. is located at 70 Fawcett St., Cambridge, Mass. 02238 (617) 497-2683. ◘

Opinions

MANAGEMENT STRATEGIES

DAVID M. RAPPAPORT AND CORY J. VAN WOLVELAERE

Why success goes unnoticed

One of the most difficult tasks facing network managers is communicating their successes. Managers must obtain recognition for their hard work or they will never receive their just rewards.

On the surface, touting the successful implementation of the latest technologies may appear to be the best measure of success. However, it's more effective to measure success in terms of cost and service. These factors, which have driven business since its inception, are easily understood by senior management. Also, because of the relative newness of communications as a strategic asset, networking professionals are in a unique position. A lack of history means they can define their own measures of success.

At first, creating success measures in terms of cost may be difficult. Many companies are not aware of their true total communications costs. They may know their monthly leased-line charges or their total WATS costs for the month, but these tell only part of the story. Other items, such as personnel, equipment depreciation and physical space must also be considered.

Managers whose companies are among the few that do not currently tabulate true communications costs should do so now. That's the first step managers must take in measuring their success.

For most businesses, total communications costs as a percentage of all expenses range from .5% to about 4%. Within this range, specific industry segments, such as manufacturing, banking or health care, may each have different figures. These values, which are readily available in trade publications, can demonstrate a manager's success.

Other widely used success measurements include cents per minute for long-distance telephone calls and monthly costs per terminal. While these are good measures for comparing alternative configurations and evaluating new services, they're not in a form that can be used by personnel outside the telecommunications department. In fact, these figures are probably meaningless to anyone except communications analysts.

For management, the only meaningful measure of communications is costs in terms of business activity. For example, a securities firm may gauge communications costs per million dollars of trading volume. Retail organizations may think in terms of percentage of sales, hospitals in terms of cost per bed and building managers in terms of cost per square foot. Management understands tailored units of measure, so such measures are more likely to pique its interest.

Service improvement measures are more difficult to define and present the biggest challenge. This is due to the exponential relationship between costs and service improvements. Expenses skyrocket as communications managers try to lower response time or improve the quality of service on their private branch exchanges. Once again, statistics like response time and percentage of calls blocked are important, but it's also necessary to measure the success of a service in terms of business activity. For example, a network manager might measure the success of an order-entry application by tracking the time required to conduct computer interactions in a typical order request.

But why is this necessary? After all, no one has asked for these figures. It's necessary because part of a communications manager's job is to spread the news of success. This is where managers must demonstrate their initiative.

We asked one successful, highly paid communications manager how he achieved his position. He replied that when he became department manager, he began tabulating his own success measures. Eventually, he decided to send each senior executive a monthly report that tracked his 10 key measures.

After receiving no feedback for several months, he stopped, thinking it was a waste of time. A week later, one of the senior executives on his distribution list called him to inquire about the report. The report helped the senior manager understand what was happening in an area as technical as telecommunications. After that call, the manager knew he would have little trouble justifying his budgets. ☑

Rappaport is partner-in-charge and Van Wolvelaere is a senior telecommunications manager with Arthur Andersen & Co.'s Telecommunications Consulting Practice in Chicago.

INDUSTRY ISSUES

BRIAN JEFFERY

BOCs: Who needs 'em?

Do we really need the regional Bell holding companies? This seems an unfair question to ask as 1986 financial results for AT&T's progeny roll in. Without exception, they are doing better than the beleaguered AT&T. For all of the BOCs, revenues, profits and earnings are up.

The RBHCs aren't suffering from AT&T's overstaffing problems, nor are they reeling from massive losses sustained by failed ventures into new markets.

Surely, the problem with the RBHCs is precisely that they are doing so well.

The North American Telecommunications Association estimates that the RBHCs have lost more than $1 billion in a variety of diversification efforts, many of which can only be charitably described as misjudged.

And anyone who has had to deal with the RBHCs knows that they are at least as overstaffed and inefficient as AT&T was shortly after divestiture. Yet unlike AT&T, there have been no layoffs, early retirement programs or the like.

Something is obviously wrong here. According to the laws driving competitive markets, the RBHCs should be reeling under massive charges and offering apologies to their shareholders. Instead, they are doing quite well, thank you, and are expanding. Now they want to get into manufacturing, long-distance and value-added services. And above all, they want all regulatory restraints removed.

Curiously, this paradox hasn't come up in deregulatory discussions; if anything, the RBHCs are looked upon as being unreasonably restrained. The noises coming from the free market-minded Federal Communications Commission suggest that the RBHCs will be released from regulation, and the Justice Department seems to feel that antitrust is a thing of the past. Shouldn't somebody be asking why the RBHCs are apparently able to defy the laws of commercial and financial logic?

Undoubtedly, the RBHCs are still massively subsidizing themselves with revenues from local telephone services. There is documented evidence of this occurring in personal computer retailing business. What's more serious, however, is that the local telephone rate increases approved by state public utility commissions are subsidizing sheer inefficiency.

The RBHCs haven't been subjected to the kinds of competitive pressures that would require them to become more efficient and better managed. There has been no shakeout, no management reshuffling and none of the organizational streamlining that normally accompanies deregulation. One should ask whether a company such as Nynex Corp., after its fiasco with the IBM Product Centers, is prepared to be a manufacturer or a long-distance service supplier.

Part of the problem is that the regulatory apparatus is still geared toward the efficiency levels and finances that characterized the Bell System prior to divestiture. As AT&T's experience demonstrates, the RBHCs' performances are far from the levels that would exist in a fully competitive market. However, the assumption that the RBHCs' performance is reasonable and that they are now competitive entities has somehow taken hold.

To allow the RBHCs to move into new, nationwide markets without a corresponding competitive stimulus is to invite trouble. As a result, effective RBHC subsi-

Jeffery is managing director of the International Technology Group, a Palo Alto, Calif.-based research and consulting firm specializing in the IBM market.

Don't let these opinions go unchallenged. *Network World* is soliciting guest-penned columns for its opinions pages. Manuscripts must be letter-quality, double-spaced and approximately 600 to 750 words in length. Disk and modem submissions are preferred. Columns should be timely, controversial, literate and technically accurate.

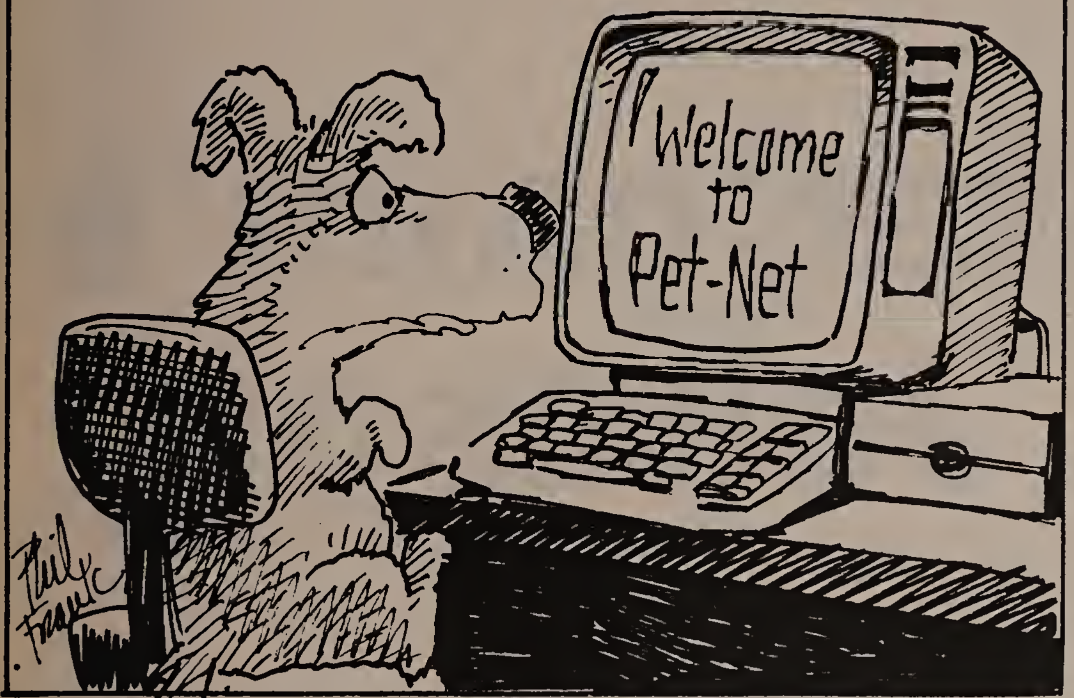
Contact Steve Moore, features editor, *Network World*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701, or call (617) 879-0700, ext. 584.

▶TELETOONS — By Phil Frank

The History of Telecommunications # 88

April 1, 1987

Telecommunications companies expand vigorously into the low-end market.



dization may be enormously increased, and the local telephone customer may end up indirectly supporting private branch exchange marketing, 800 services and other national and international offerings.

Equally serious is the risk that the RBHCs will use their competitive advantage to crowd markets and undercut more efficient suppliers. This could bring down the performance level of the industry at a time when it faces mounting overseas competition.

That these issues are not being raised reflects the peculiar logic guiding the deregulatory process. Despite the vast effort expended on deregulation, nobody has even defined what it is supposed to achieve.

> Despite the effort expended on deregulation, nobody has defined what it is supposed to achieve.

In the case of the airline industry, the purpose of creating genuine competition was to improve the quality, availability and price of airline services. That has happened. Yet in the telecommunications industry, the quality of service has scarcely improved, prices have increased in many areas and it's still unclear who has benefited.

Moreover, the deregulatory process has become bogged down in a morass of litigation, most of which has nothing to do with improving the quality of products and services.

Further deregulation is not the answer. Rather, what is needed is some hard thinking about what kind of telecommunications industry the U.S. wants and what it's trying to achieve by deregulating it.

If the objective is true competition, then the RBHCs must be exposed to full competition like everyone else. If the objective isn't a competitive market, then what is it? It would be a sad ending for the deregulatory process if it achieved nothing. ◻

PBXS VS. LANS

JOHN CAROSELLA AND BOB REINHOLD

Reconcilable differences

Have you ever heard an argument that truly bothered you because you thought both sides had missed the boat? Here's one of our favorites: Will the local-area network or the private branch exchange win the battle for local data switching?

PBX proponents (read: vendors) tell users that voice/data integration is the way of the future. Users with any sense or vision of the future, they say, should be installing huge nonblocking switches for all their local data-switching needs. Integrated Services Digital Network is just around the corner.

The other side argues that PBXs aren't made for data and are never a good choice for users' local data-switching requirements. They puff about the inefficient nature of data transmission through the PBX, citing high costs, incompatibility of voice and data traffic and a host of other horrible things. They say the integration of voice and data is just a marketing hoax, and ISDN will be a long time coming. Even when ISDN does arrive, few will have a need for so much bandwidth.

But both sides have neglected that popular political concept of the '70s: detente. What about a little peaceful coexistence between the two camps? After all, isn't the PBX just another type of local data network? All local networks are not created equal. Each has its own best application. One's choice of a local networking vehicle should be based first on whether a network can serve all the requirements of the user's applications effectively, economically and for the next five years.

Some PBX vendors offer features that provide solutions to users' local data networking requirements. One example is Intecom, Inc.'s LANmark Ethernet local network, which offers a good way to overcome the distance limitations that constrain many Ethernet products. AT&T's Digital Multiplexed Interface (DMI) and Northern Telecom, Inc.'s Computer-to-PBX Interface (CPI) offer users economical ways to connect a large number of ports for host access and port sharing.

In general, the PBX is well-suited to environments where data communications requirements are nonhomogeneous and users are geographically dispersed and nomadic. The nature of most PBX data applications enables different groups of users to have different types of data connectivity simultaneously. Finally, twisted-pair telephone wire's ubiquity and ease of handling offer great advantages in environments where users change their locations often.

On the flip side, for high-speed connectivity among a cluster of users, other local nets usually provide more bandwidth-efficient and cost-effective solutions. Furthermore, even simple data functions like asynchronous terminal switching can cost a pretty penny with a PBX.

In a recent contract, Network Strategies, Inc. assisted a client in procuring a 1,000-line voice system. The firm received proposals from each of the major PBX vendors, and the bids for a voice-only system all came in between $700,000 and $800,000. The firm also requested an estimate for the cost of 100 more data lines to be used for asynchronous terminal switching. The bids jumped, uniformly for all of the vendors, by $100,000. Users probably don't need the services of a consultant to find ways to do terminal switching for under $1,000 per port.

In summary, the decision to purchase a voice/data PBX or a local network depends on context and not technology. PBXs work as local data networks. The question is, would you want your personal computer to marry one? This decision shouldn't be based on technology, but on whether a PBX cost-effectively meets your requirements.

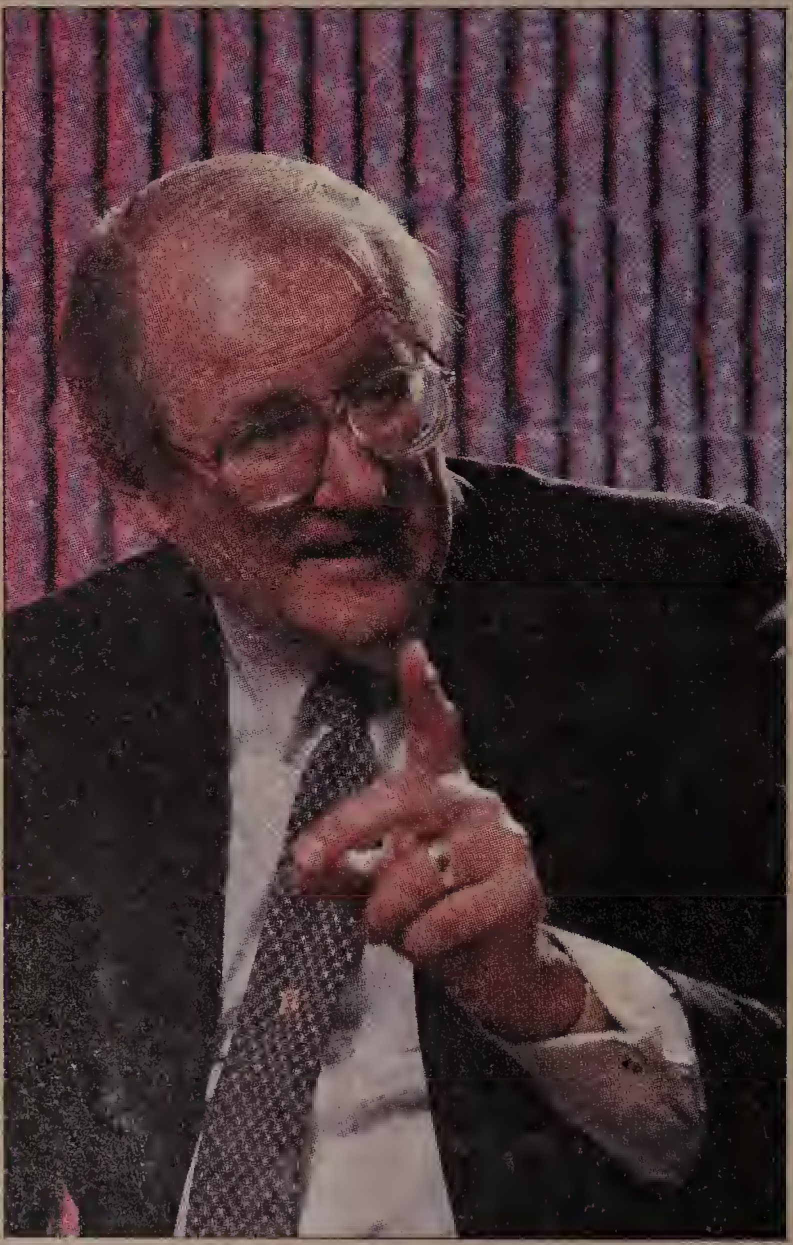
A PBX is a local-area network, not just a local-area network alternative. No single brand or generation of local net is the solution to every local networking problem. Local communications is a market full of niches, and different products are well-suited to each. For local communications, the PBX will never replace the local network. And no single local net technology will be a panacea that replaces all other types of local networks, PBXs included. ◻

Carosella and Reinhold are consultants with Network Strategies, Inc., a communications consulting firm in Fairfax, Va.

NETWORK WORLD

Features
March 30, 1987

General DataComm's Charles P. Johnson



BY KARYL SCOTT
Washington, D.C. Correspondent

Charles P. Johnson, chairman and chief executive officer of General DataComm Industries, Inc. in Middlebury, Conn., is one of eight principals who founded the company in 1969. The 59-year-old Johnson has also held management positions at ITT Corp., Litton Industries, Inc., Kellogg Co. and Stelma, Inc. While at ITT, Johnson was part of the team that designed the communications systems for the U.S. ballistic missile program and the U.S. Air Force's Strategic Air Command nuclear missile program.

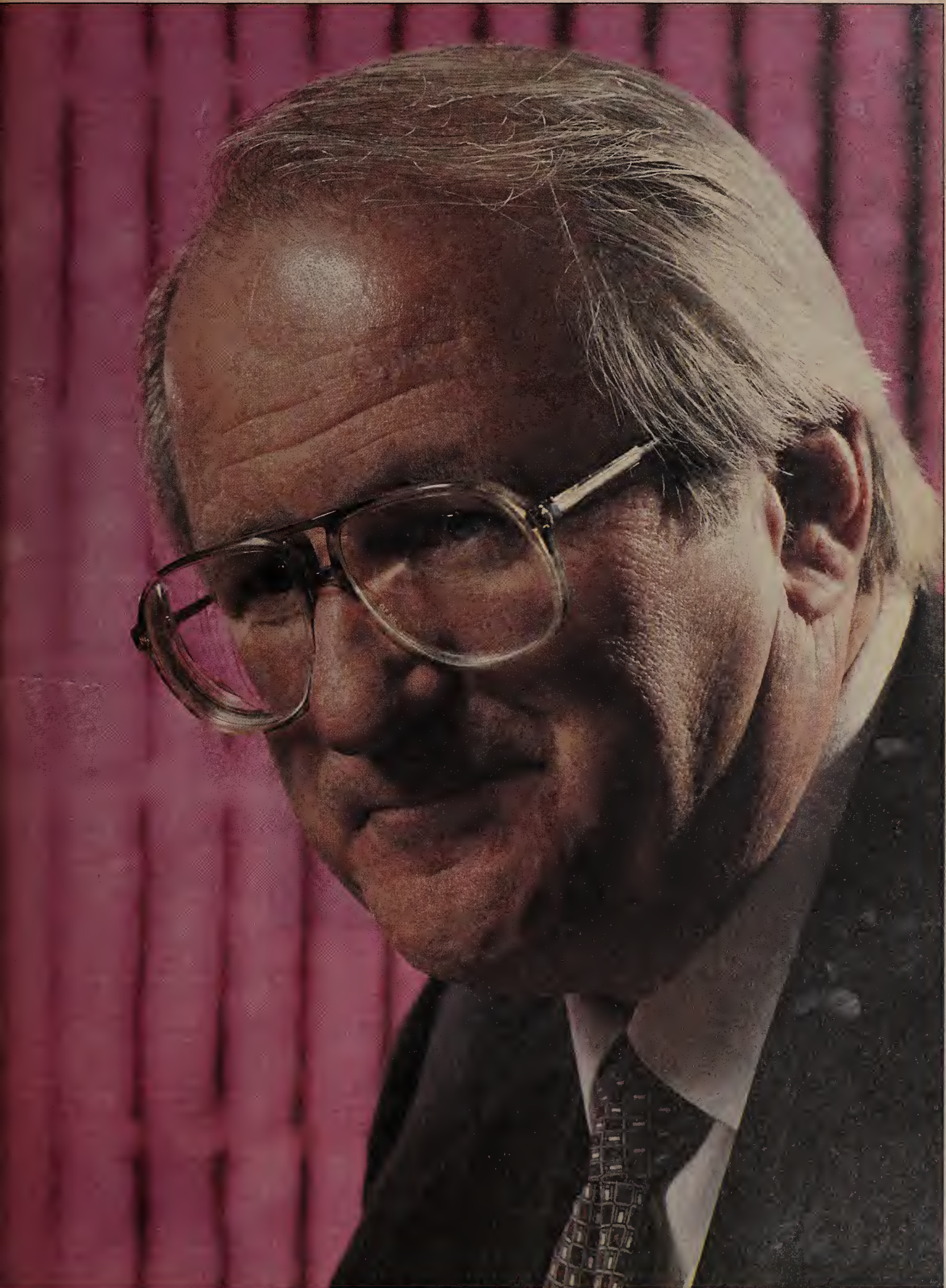
Johnson got his start in the communications business working through the ranks of the Bell System, where he did everything from repairing and installing equipment to designing networks. Johnson holds a bachelor of science degree in electrical engineering from Northwestern University.

The opinionated and forthright Johnson met with Network World *Washington, D.C. Correspondent Karyl Scott recently to discuss technological and regulatory trends in the communications industry.*

How concerned are you about the possibility of having to compete with the Bell operating companies if U.S. District Court Judge Harold Greene allows the BOCs to enter the equipment manufacturing business?

I don't think the Department of Justice's recommendations to Judge Greene will go through. During the public comment period, many facts will be brought to light, and I think there will be some serious embarrassment at the Justice Department.

☞ See **Johnson** page 36



WALTER P. CALLAHAN PHOTOS © 1987

Johnson from **page 34**

Why will the Justice Department be embarrassed?

The Justice Department came out with a policy that someone within the administration wanted, and that policy was independent of the facts surrounding this business. It will become quite apparent that the Justice opinion is not based on fact. There are gross misrepresentations being made by very senior government officials that have to be addressed. None of the claims by the Justice Department of changed conditions in the industry are justified.

What facts should be brought to light?

This is not a question of deregulating the BOCs. It's a question of whether the government can abort two consent decrees, the legal agreements it entered into with AT&T and GTE Corp. Justice's recommendations to free the BOCs are based on Federal Communications Commission rule changes on how the BOCs should separate and account for costs. The Department of Justice is basing [its recommendations] on rules that have not been implemented and are as yet unproven. I can't understand how this will give consumers and competitors more protection against cross-subsidization and monopoly practices.

> "This is an intriguing situation. One day somebody is going to take a look at this and ask, 'Who's the Ollie North of telecommunications regulation?'"

Furthermore, the BOCs have hired a number of federal officials out of Washington, D.C. — usually after these officials have assumed a favorable public policy stance toward the BOCs. This is an intriguing situation. One day somebody is going to take a look at this and ask, 'Who's the Ollie North of telecommunications regulation?'

So what you're saying is that the deck is stacked in favor of the BOCs?

The BOCs have a technological and economic advantage over all other service providers. Enhanced service providers, for example, are charged twice by a BOC for leased lines: when the call goes in the central office and when it comes out. The BOCs don't charge themselves twice.

What's the solution?

The BOCs should allow the enhanced-service providers to collocate equipment at their central offices. The BOCs could form a real-estate subsidiary and lease space in the central office to enhanced-service providers. This would give the competition transmission quality equal to that of the BOCs. When the enhanced-service providers' switching equipment is located outside the central office, there's a greater incidence of transmission loss. This means that the other provider's transmission quality is inferior to the BOCs'.

Have you made this proposal to the FCC?

Yes, but dealing with the FCC is like dealing with a young man in college who doesn't know anything about the realities of the world: All he knows about is theory. The FCC is full of young theoreticians who don't understand the realities of the business world.

In the event Judge Greene does allow the BOCs into manufacturing, what effect will this have on businesses like yours?

I don't think that would be in the interest of the industry or consumers. The only way I would agree to letting the BOCs get into my business is if the BOCs let me collocate my equipment in their central offices and allow me to get into their business. Under the current scenario, I can't compete with a BOC because I don't have the same access to transmission and switching facilities. If I have a new piece of equipment, I can't sell it until the BOC makes the necessary changes in the central office to allow my equipment to operate over [its] network. If I wait until after the BOC has developed this enhancement, it will have already beaten me to the market.

Another problem with letting the BOCs into manufacutring is that each will develop its own standards, and the networks are going to vary by region. If the BOCs are making their own central-office equipment, they'll sell the equipment they manufacture to themselves because under a mo-

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nopoly structure, they don't have to be cost-effective. The profits from the unregulated manufacturing business will go right over to the shareholders. What better way to take money from your rate base and give it to your shareholders?

What do you think of the FCC's Comparably Efficient Interconnection/Open Network Architecture (CEI/ONA) plan?

It doesn't make any sense. The problem with ONA is that the carriers will set a standard and everybody else in the industry will have to conform to that standard. This will allow the BOCs to manufacture central-office equipment, which they will sell to themselves at inflated prices and then they'll pass those excessive costs on to the customers. If you really want to make services and facilities available to everyone, you should open up the BOC wire centers and allow everybody's technology to run on the BOC facilities.

What kind of job has the FCC done in protecting the interests of the consumer and competition?

I haven't met anybody at the FCC who seems to know anything about the telecommunications industry. I've spent 36 years in communications and it's frustrating to see they have no understanding of what they're doing. I'm stunned by the attitude of some FCC officials who seem to be saying 'Don't bother me with the facts, because I've already made up my mind.' I get the feeling that everybody is trying to invoke policy that conforms to what someone higher up wants, rather than looking at the facts to determine what's best for the situation.

> "I haven't met anybody at the FCC who seems to know anything about the telecommunications industry."

General DataComm has a relatively low profile despite its having been around for 17 years. Why is that, and are you making an attempt to increase public awareness of what you have to offer?

Historically, we've spent more money in product development than we have on marketing and advertising. For many years, most of our business was with the carriers, and in that market, the quality of the product is more important than the image you create. When [the Second Computer Inquiry] was introduced by the FCC, the rules of the game changed, and we got more involved in the end-user market.

How have you fared in overseas markets? Has foreign protectionism hurt your ability to be a worldwide player?

We have a subsidiary in the UK and another in Canada. We have major contracts with Telecom Canada and Mercury Communications Ltd. of the UK for data communications equipment. We were largely responsible for the design of Mercury's countrywide data network. Other than that, we've had problems. The West Germans and Japanese are particularly resistant to letting American vendors sell in their markets. Japanese and German companies are particularly interested in selling in the U.S. market, and if you look around the trade shows, you see them all over the place. Too bad they aren't as willing to let us into their markets.

Didn't the Germans open the modem market to foreign companies recently?

The Germans opened their market to allow foreign firms to sell analog modems, but the world is turning to digital communications.

What the Germans gave us is really nothing. They have opened up the market where it's either flat or dying. That way they can pretend to open up markets while protecting the growth areas for their own companies.

Do you think the U.S. government will be able to enact any changes in foreign-market entry for U.S. firms?

Yes. I think we will see legislation passed this year that requires trade reciprocity. I don't want to see trade protectionism. I just want to be able to sell in a [foreign] market if foreign firms are selling in the U.S. Reciprocity must be on a product-by-product basis. I don't think a foreign company should be able to circumvent the rules, either, by having manufacturing plants in the U.S. Using U.S. labor isn't enough; there's still foreign [research and development] that

See **Johnson** page 39

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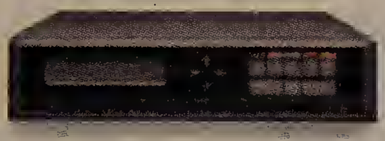

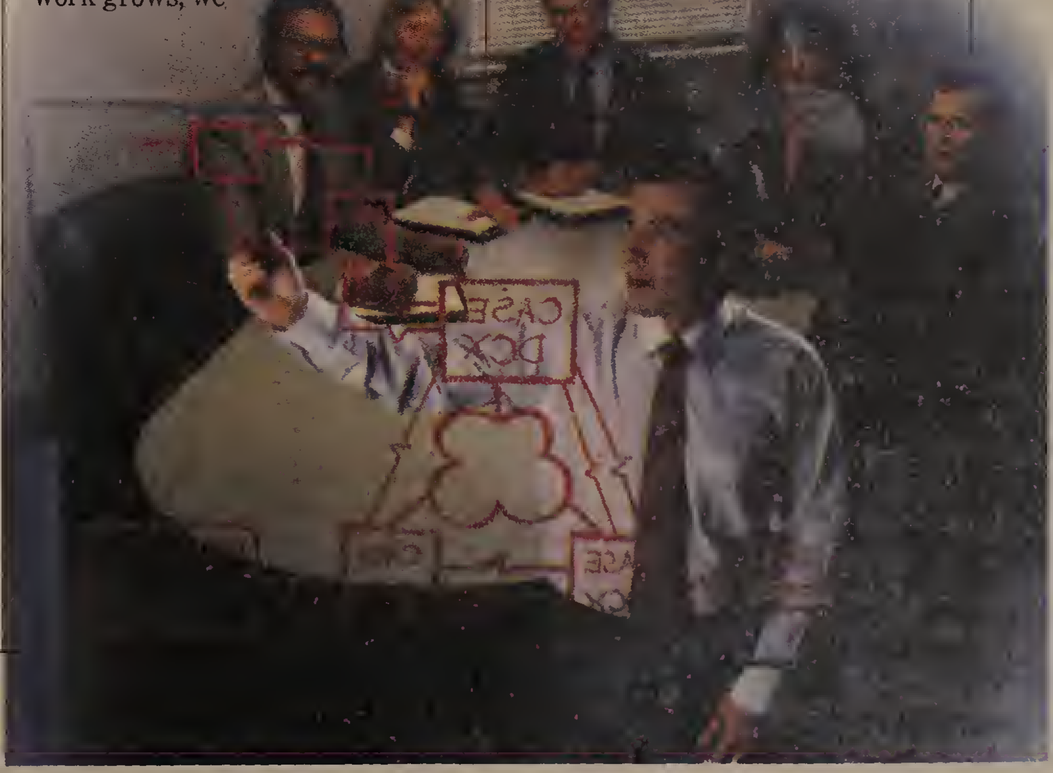

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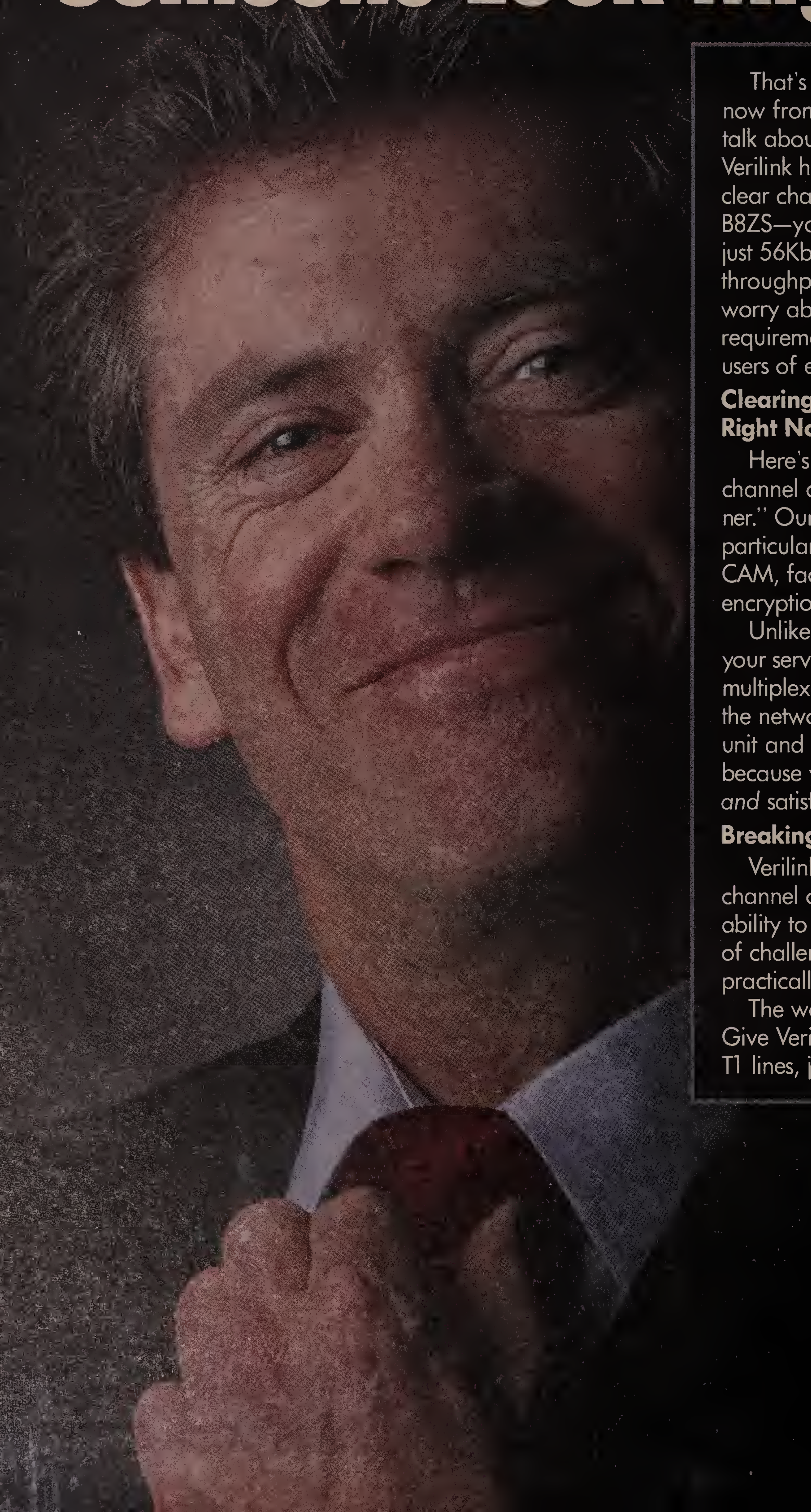

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Johnson from **page 37**

produced that product.

You are now marketing everything from modems to total network design and systems integration to end users. Are you trying to position yourself out of the modem market in anticipation of the time when modems will no longer be a necessary part of networks?

No. The modem market will be around for a long while. Modem markets will grow horizontally. The natural evolution is to go to higher speeds. The price of a high-speed modem is not that much different from that of a low-speed modem. Line prices are going up, though. The cost of moving information can be reduced by going to higher-speed data transmission. The number of units sold continues to grow, but the number of dollars in the market is relatively flat because of the competition. There's a lot of cost cutting to maintain market share — lots of price erosion in the last couple of years.

With the advent of digital lines, don't you see the need for modems disappearing?

No, because modems are more flexible than digital lines. For example, if you have a modem, you're not constrained to a fixed architecture. If you're in a digital network, you can only get the service where the carrier offers the service. Analog lines are everywhere. If I wanted digital service from my plant in Middlebury to a plant across the street, the circuit to the digital access lines would have to run all the way back to Hartford, Conn. If I provided that service over analog lines, the information would only have to travel to the Middlebury telephone office. We're talking about the difference between three miles of cable and 100 miles of cable.

"The modem market will be around for a long while."

How will digital lines be deployed throughout the country?

Digital services will predominate in the long-haul market. I foresee a hybrid world. I see analog modems going to concentrators. The concentrators will then be connected to digital circuits to go to another city. When you get to the other city, you will feed out analog. Then you don't have the backhaul problem associated with digital architecture. Hybrid combines the best of both worlds: high-capacity intercity services over digital circuits and local distribution over analog lines married with multiplexers, concentrators and switches.

"There's no incentive for the BOCs to introduce new types of access to spur development of T-1 service."

How long has General DataComm been in the T-1 multiplexer market?

We've been in it for about 10 years. We were one of the first companies selling to the Fortune 1,000 private network market.

What are the hot trends in T-1?

I see the same pattern of usage that I've seen in the past several years. T-1 use is a function of the line cost, not the equipment cost. AT&T's recent line-cost reductions will spur the growth of the market. We still have a problem, though, with the regional BOCs that want to use strategic pricing for access lines and not cost-based pricing. There's no incentive for the BOCs to introduce new types of access to spur the development of T-1 service. They want to keep people on the same type of access circuits they're on now.

You recently introduced a new T-1 multiplexer called MegaSwitch. Is this just a retread of your MegaMux Plus introduced last September at the Tele-Communications Association show? I understand there were some bugs in the MegaMux.

We did have some bugs with the MegaMux, but those were fixed in a short period of time. MegaSwitch is not the same product as MegaMux. We feel the product has sufficient enhancements and new features to call it a new product. It can perform network management between data sets, can handle more circuits and twice the voice transmission as MegaMux, and we introduced low bit-rate voice transmission. ☑

Putting more intelligence in the network provides network integrators with the flexibility to define and address diverse network applications and requirements. With intelligence in the network, users can support applications that include transaction processing, host to host transfers, proprietary protocols, resource sharing between multiple vendor hosts, and network gateways.

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As networking takes over the world, Network World takes over the market.

NETWORK WORLD

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SMALL SWITCH MARKET

AT&T renovates low-end strategy

GBS's Blanchard dispels rumors, outlines plans.

The trend has never been clearer. Networking is now the major application market for communications. And a recent statement by Ken Olsen, President and Founder of Digital Equipment Corporation, substantiates this trend: "We have to start thinking of the computers as peripherals. You start with the network, then you hang the computers on later."

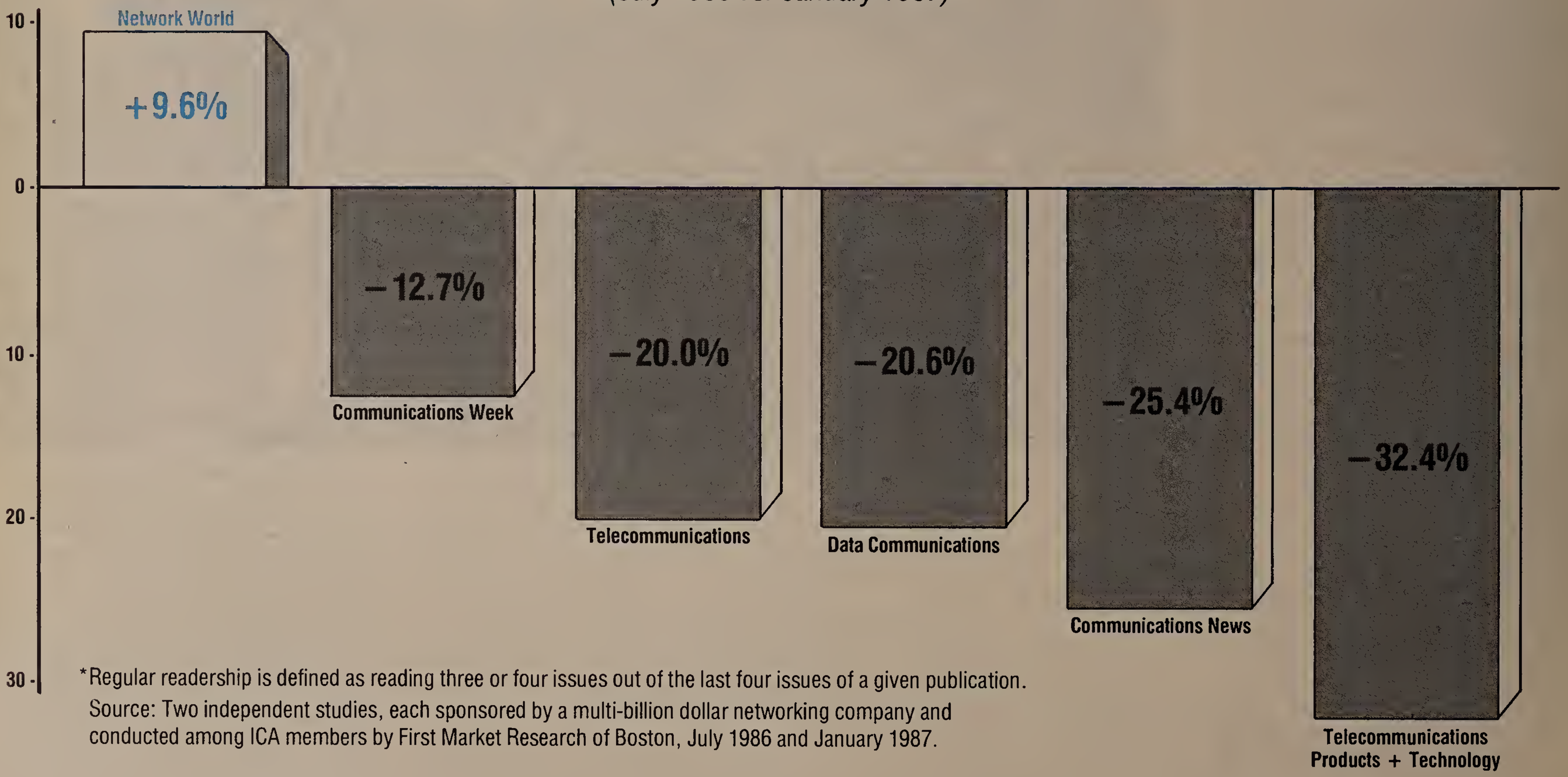
Networking. It's been *Network World's* focus from the very start. In fact, it is the *only* publication that covers the entire realm of communications from the networking point of view. And in doing so, *Network World* has established itself as the *standard* for communications users already networked or planning to network.

Today's users know they need up-to-date information in order to keep pace with the evolving world of networking. That's why they read *Network World*. And that's why *Network World* was the only publication to gain in regular readership in an independent study conducted among ICA (International Communications Association) members, some of the nation's most influential buying decision-makers for voice and data communications products and services.

The study, sponsored by a multi-billion dollar networking company and conducted in January 1987 by First Market Research of Boston, showed decreased readership of all communications oriented publications among ICA members since a previous study in July 1986. Only *Network World*, with its exclusive networking-oriented coverage, experienced an increase in regular readership. The percentage increase/decrease for each publication over that six-month period is displayed in the following chart.

Percentage Change in Regular Readership* among ICA Members

(July 1986 vs. January 1987)



*Regular readership is defined as reading three or four issues out of the last four issues of a given publication.

Source: Two independent studies, each sponsored by a multi-billion dollar networking company and conducted among ICA members by First Market Research of Boston, July 1986 and January 1987.

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Buying the big switch

Sometimes when the price is right, the support isn't.

Continued from page 1

blocking, have excellent voice quantization and handle data better. And it's still a buyer's market. About a dozen companies sell medium- to large-scale data PBXs, but with only a limited number of potential customers, competition has become cutthroat.

The cost per line for PBXs has dropped steadily over the past four years due to lower cost hardware, more efficient manufacturing and heavy competition. In 1983, the cost per line for an average system was roughly $850; by 1986, it was down to $730, according to Greg Carlsted, senior industry analyst for Dataquest, Inc. in San Jose, Calif. As the competition continues to intensify, users will see more price-cutting.

A high percentage of digital PBXs were installed between 1979 and 1984, and by 1990, most analog PBXs will have been replaced, according to Carlsted. Given a PBX's seven-year life, it will be 1988 at the earliest before these newer PBXs

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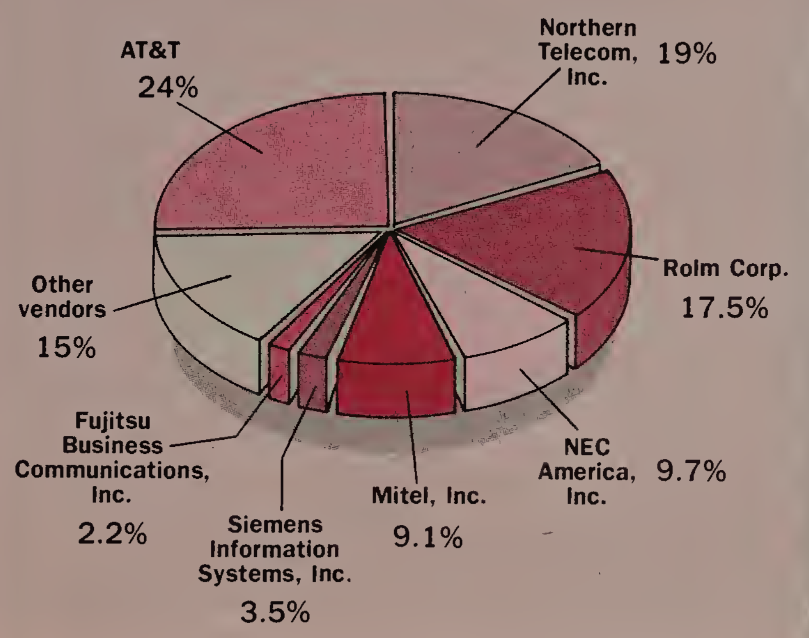
Hunter is president of TMS Corp., a marketing management consulting firm in Devon, Pa.

The major PBX vendors' market share



Note: All figures based on vendors' 1986 product shipments.

SOURCE: TMS CORP., DEVON, PA.

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are replaced. "The survival strategy for most PBX vendors in the near future will be to gain market share at almost any cost and then sell add-ons to their customers. Vendors that do not have at least 3% of the market right now are going to have serious problems," Carlsted says.

Carlsted's observations are consistent with a *Network World* study ("PBX makers sell low to nab market share," *NW*, March 2), which revealed that vendors are selling PBXs near cost and then making their money selling add-ons such as line expansion cards, voice and text messaging, least-cost routing software and custom application software. Most vendors, however, are tossing in least-cost routing and automatic call distribution to sweeten the deal. Of the vendors listed in the accompanying chart, only Compunetics, Inc. charges for automatic call distribution, and only AT&T and Ericsson Information Systems, Inc. bill for least-cost routing. However, many vendors charge extra for

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> "The survival strategy for most PBX vendors in the near future will be to gain market share at almost any cost and then sell add-ons to their customers. Vendors that do not have at least 3% of the market right now are going to have serious problems."

Product focus: digital private branch exchanges

Vendor	Model	Minimum/maximum number of lines	Line expansion increments	Maximum number of time slots	Busy-hour call attempts	Maximum nonblocked calls	Host interface	Local-area network interface	Maximum data transfer rate (bit/sec)	Messaging Voice	Messaging Text	Minimum/maximum cost per line
AT&T Morristown, N.J.	System 75	40/800	8 or 16 lines per card	512	3,600	482	DMI	Starlan, ISN	19.2K asynchronous, 64K synchronous	Optional	Optional	$596/$821 average cost*
	System 85	400/10,000	8 lines per card	15,872	65,000-400,000	8,000	DMI	ISN	19.2K asynchronous, 64K synchronous	Optional	Optional	NA/$814**
Compunetics, Inc. Monroeville, Pa.	Digital Switching System	128/30,000	16 lines per card	30,000	NA	4,000			19.2K asynchronous, 56K synchronous	Optional	Optional	$300/$500
Ericsson Information Systems, Inc. Richardson, Texas	MD-110	200/12,000	8 lines per card	15,360	129,600	7,680	DMI		19.2K asynchronous, 48K synchronous	✓	✓	NA/$750
Fujitsu Business Communications, Inc. Anaheim, Calif.	focus 960	40/2,000	8 lines per card	512	3,960	127	IBM		19.2K asynchronous, 9.6K synchronous	Optional		$400/$600
GTE Business Systems, Inc. Tempe, Ariz.	Omni S III	250/2,048	8 lines per card	768	20,000	384			19.2K asynchronous, 64K synchronous	Optional		$200/$800
Harris Corp. Digital Telephone Systems Division Novato, Calif.	20-20	9/1,920	8 or 16 lines per card	1,920	25,000	960	DMI		19.2K asynchronous, 56K synchronous	✓	✓	$400/$600
InteCom, Inc. Allen, Texas	IBX S/XX	256/16,384	NA	32,786	NA	16,384		Ethernet	19.2K asynchronous, 56K synchronous	Optional	Optional	$600/$1,100
Mitel, Inc. Boca Raton, Fla.	SX-200	40/350	12 lines per card	512	1,423	100			19.2K asynchronous	✓	✓	Contact dealers
	SX-2000	16/5,376	16 lines per card	NA	9,590	750		Ethernet	19.2K asynchronous	Optional	Optional	Contact dealers
NEC America, Inc. Business Systems Division Melville, N.Y.	NEAX-2400	160/23,184	NA	24,192	99,200	6,144		Ethernet	19.2K asynchronous, 9.6K synchronous	✓	✓	Contact distributors
Northern Telecom, Inc. Richardson, Texas	SL-1	32/5,000	4 to 16 lines per card	5,120	28,000	1,500	IBM 3270 emulation, System/36 and System/38	Ethernet	19.2K asynchronous, 56K synchronous	✓	✓	$550/$1,200
	SL-100	5,000/30,000	NA	61,440	200,000	30,000	IBM 3270 emulation, System/36 and System/38	Ethernet	19.2K asynchronous, 64K synchronous	✓	✓	$550/$1,200
Redcom Laboratories, Inc. Victor, N.Y.	MBX	28/1,200	NA	2,048	15,000	2,048	Any host		9.6K asynchronous, 64K synchronous	✓	✓	$400/$800
Rolm Corp. Santa Clara, Calif.	CBXII 9000AE	100/20,000	8 lines per card	23,040	165,000	20,000		Ethernet (external gateway)	19.2K asynchronous, 56K synchronous	✓	✓	$550/$1,200
	CBXII 8000	100/400	8 lines per card	384	10,000	384		Ethernet (external gateway)	19.2K asynchronous, 56K synchronous	✓	✓	$550/$1,200
Siemens Information Systems, Inc. Communication Systems & Networks Group Boca Raton, Fla.	Saturn IIE	40/864	8 or 16 lines per card	1,024	10,000	432			19.2K asynchronous	✓	✓	$400/$1,000
	Saturn III	150/992	4 or 16 lines per card	256	10,000	467			19.2K asynchronous	✓	✓	$400/$1,000
Telex Computer Products, Inc. Tulsa, Okla.	Telex 1001	32/2,048	32 lines per card	2,048	36,864	1,024	IBM 3270, System/34, System/36, System/38		19.2K asynchronous	Optional		$690/$1,090
	Telex 1200	300/1,200	6 analog, 24 digital	2,048	5,000	672			19.2K asynchronous, 64K synchronous			$600/$1,000
	Telex 5000	NA/5,000	6 analog, 24 digital	8,192	22,000	2,688			19.2K asynchronous, 64K synchronous			$700/$1,100
Tie/communications, Inc. Shelton, Conn.	Mercury 2000	640/1,920	8 lines per card	640	NA	640			19.2K asynchronous, 64K synchronous			$375/$600
	M-1000	60/512	8 lines per card	128	NA	256			19.2K asynchronous			$375/$600

DMI = Digital Multiplexed Interface
ISN = Information Systems Network
NA = Not available
*Higher cost for 100-line system composed of 60% analog, 30% digital and 10% hybrid lines; lower figure for 550 lines with same line composition percentages.
**Price based on 1,300-line system comprising 20% digital, 10% hybrid and 70% analog lines.

SOURCE: TMS CORP., DEVON, PA.

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voice and text messaging.

If you're leaning toward going with a smaller vendor, however, keep in mind that if the vendor has a small customer base, its prospects for survival, as Carlsted says, are questionable.

A good indicator of a vendor's survivability is the percentage of the market the company holds and whether the company has increased market share steadily over the last five years.

Where users pay

Custom software is where PBX vendors can play hardball. Using a third-party source for custom-software development can void the PBX vendor's warranty, and the vendor can easily engage in finger-pointing should a problem occur.

Users can't afford to have a PBX down for any length of time, and PBX vendors know that most people will stay with a single source to avoid multivendor hassles. As a result, users should be prepared to pay plenty for custom applications.

How much is hard to say, but according to Carlsted, automatic call distribution software costs a hefty 5% of the system price, and most vendors include that with the system. Custom software will no doubt cost considerably more.

> Custom software is where PBX vendors can play hardball.

If a PBX vendor makes a software patch, don't assume it will initially work with your system.

"About 95% of the systems are unique," according to Tom Frenette, network communications manager for Black & Decker Corp. and the president of the AT&T System 85 Users Group.

"And without complete engineering information, the patch may not be 100% compatible," he said.

Systems compared

The comparison chart lists the most important features of 23 digital PBXs. Indicated are the lowest and highest number of lines that can be practically configured.

The number of line-expansion increments should give users an idea of how many expansion boards will be needed to expand each system up to its break points (where additional hardware and software are needed).

The vendor word

Many vendors say that they are not sure what the break points are or what is involved in upgrading, but a few are more straightforward.

The Intecom, Inc. IBX has break points at 3,000 and 11,000 lines and requires minor hardware and software changes. The new Rolm Corp. CBXII 9000AE, scheduled for delivery in the third quarter of 1987, requires adding nodes (1,333 lines each), but requires no software changes.

Users can add up to 15 such nodes, and Rolm claims the architecture is distributed. But the NEC Corp. NEAX-2400 is the PBX that comes closest to having a truly distributed architecture, requiring only additional line modules.

Finally, the costly items in upgrading are central processors and software, so users should see if those are required.

How important is distributed architecture? It does reduce the risk that a key component failure will bring down the PBX, as is the case with a centralized architecture, but critical components can be ordered with redundant backups. Walter Ulrich of Coo-

See **Switch** page 44

the new digital SATURN I voice/data PABX system.

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pers & Lybrand's Walter Ulrich Consulting subsidiary, cautions that PBX shoppers shouldn't be wooed by the glitter of distributed architecture.

"It's a matter of application. Distribution makes sense for large networks in which a high degree of operating autonomy is needed. However, the software needed to control and coordinate a distributed PBX is complex, and software problems are harder to fix than a hardware failure."

Time-slot capacity

When evaluating a PBX, many users are confused about the relevance of time slots and busy-hour call attempts in judging a switch's call-carrying capacity.

According to Verdette Hall, director of Telecommunications Consulting Practice for Coopers & Lybrand's Houston office, time-slot capacity is meaningless unless you know the architecture of the PBX.

"Some switches use two time slots for an intraoffice call, and some use multiple time slots for call forwarding and call transfer. The number of simultaneous calls is a more accurate measure of call handling," Hall says.

> "The software needed to control and coordinate a distributed PBX is complex, and software problems are harder to fix than a hardware failure."

Busy-hour call attempts, in Hall's view, are a good barometer of how powerful the switch's processor is, since it directs all traffic, sets up calls and performs all system administration tasks. A slow processor degrades overall service.

PBXs vs. local nets

How well do digital PBXs handle data? For casual users transferring files, they do well. Beyond that, users should look for another alternative.

"The average voice call runs about four minutes, while data users stay on [the line] an average of 20 minutes. What's worse, interactive users, such as IBM 3270 operators, stay logged on all day, depriving other users of access," says Paul Daubitz, president of ATI Telemanagement in Boston.

"Heavy data users should look for an alternative like a local-area network or some other cheap networking scheme. Using a PBX for data costs between $600 and $1,000 per port, and that's not cost-effective," Daubitz claims.

Ulrich agrees that a local-area network is a better alternative, especially since PBXs lack the switching sophistication needed to provide acceptable local network services.

"LAN users expect minimal delays, and a PBX might be too slow," Ulrich says. He adds that the PBX might make a good vehicle for linking local nets, but it is not a good local net alternative.

Is data transfer a large PBX application? Not now, but it will be in a few years. According to Dataquest's Carlsted, only about 4% of PBX applications were data in 1984, but the volume grew to around 8% last year.

> "Heavy data users should look for an alternative like a local-area network or some other cheap scheme. Using a PBX for data costs between $600 and $1,000 per port."

By 1990, Dataquest predicts that between 15% and 18% of all PBX traffic will be data. The reason that data has been slow to catch on, according to Carlsted, is that earlier PBXs didn't do a good job of switching.

They couldn't handle high data rates, and the cost for transmitting data was too high. They've gotten much better, but Carlsted says that a local-area network is still the better choice for most data applications.

Another PBX alternative some users may consider is Centrex. But whether Centrex is a better choice

The T1
wide area
network
that will cost
you
the most?

is a matter of preference. Centrex handles traffic well; it's great for scattered locations, and it relieves the customer of the responsibility of managing the system. But users lose control over their network, and Centrex does not allow the close call-accounting management supported with in-house systems.

Bigger isn't always better

When selecting a specific vendor, some users make the mistake of thinking that large companies with huge support staffs provide superior service. This is not always the case, as one unhappy AT&T System 85 user attests.

The user, who asked to remain anonymous, says that AT&T's bid was quoted with a single processor to keep the price down and win the job. AT&T, he says, said that dual processors were unnecessary, since their processor had a mean-time-between-failure rate of about two years. "We bought that argument, and we've been paying for that lie ever since," he says. "We've been running the PBX for about a year, and we've had several processor failures. In fact, it failed three times in one day. AT&T always fixed the problem, but we were down for up to four hours at a time."

When selecting a specific vendor, some users make the mistake of thinking that large companies with huge support staffs provide superior service. This is not always the case, as one System 85 user attests.

The company selected the System 85 because the price was right and it felt that going with a big company was a safe bet. What they didn't anticipate was poor support.

"I believe that AT&T has taken their cost-cutting program too far; they're getting rid of good field service people, and they're not stocking equipment the way they used to. It takes 90 days to get certain handsets, and we're not talking about anything exotic," the user says.

User counterpoint

A contrasting opinion is that of Black & Decker's Frenette, who says he has not experienced any processor failures with his three System 85s, and one has been running for three years. "Our processor has been fine. Yes, we've had alarms, but the system continued to operate," he says.

Do users group members get preferential treatment? "I wouldn't say preferential," Frenette says, "but it's true that local AT&T people are quite sensitive to our complaints."

Users thinking of buying a specific PBX would be smart to contact a users group for that product, if one exists, or call in a consultant knowledgeable about the vendor's system and support network.

Before you buy

Users thinking of buying a specific PBX would be smart to contact a users group for that product, if one exists, or call in a consultant who is knowledgeable about the vendor's system and support network. It might cost a few bucks, but the extra assurance is worth it.

Also, before selecting a product, managers should interview the vendor's support representatives as they would a potential employee.

While selecting a small company with a marginal market share is risky, often a smaller, more established vendor with a good track record may have better people and may be more eager to please than a large company. ☑

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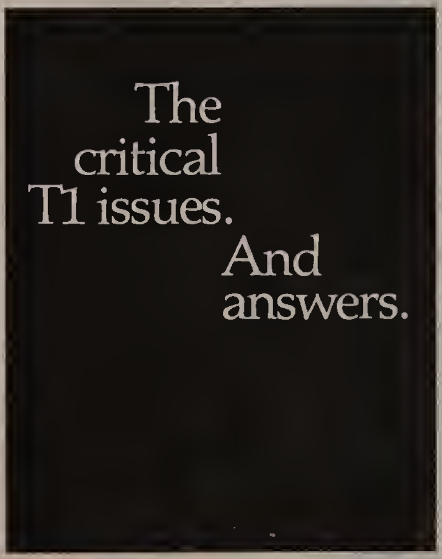

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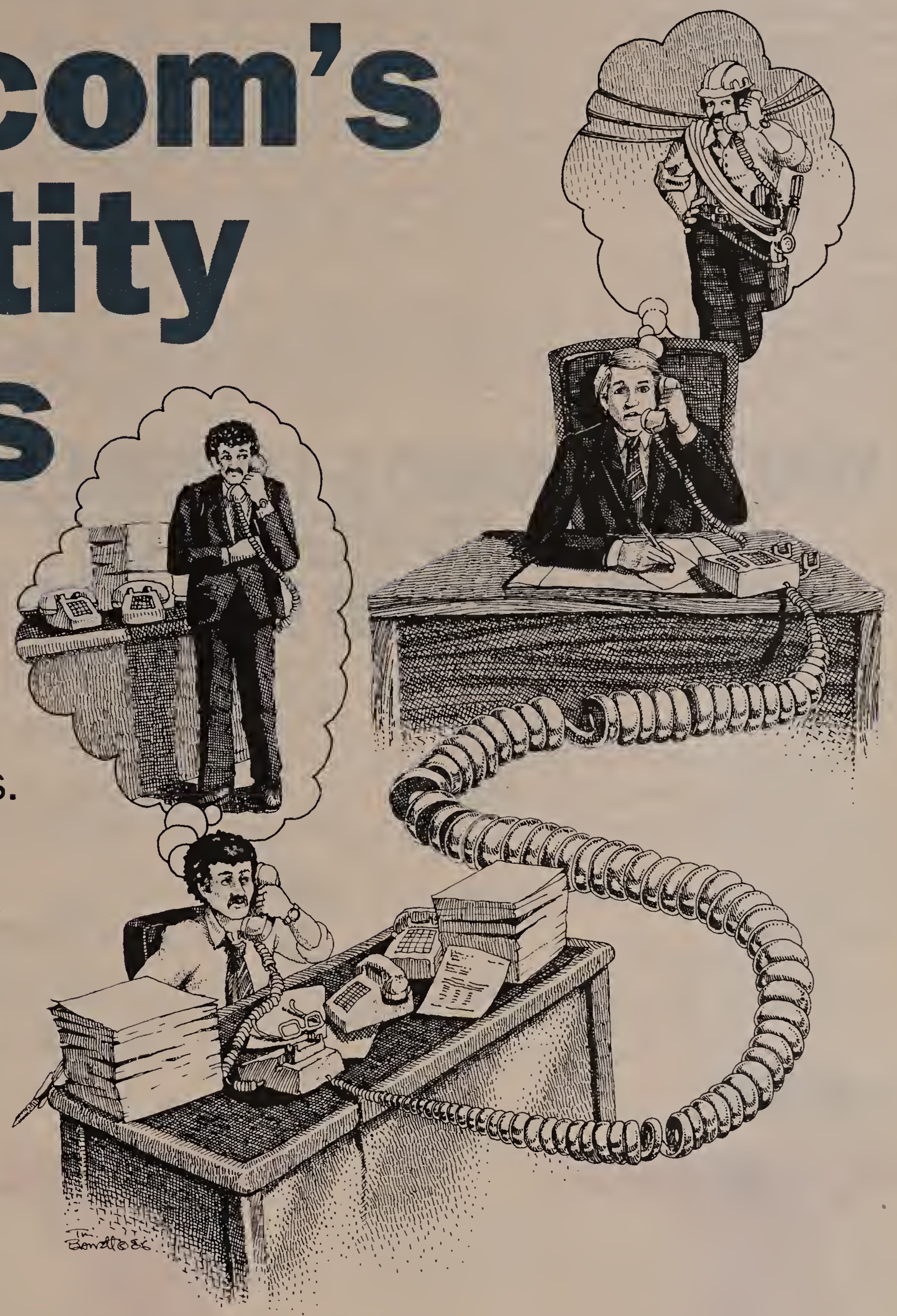
Here's how senior managers and technical managers view telecommunications.



TOM BARRETT

BY TOM LODAHL AND KAY REDDITT
Special to Network World

In the last quarter of 1986, *Network World* sponsored a series of focus group discussions to explore differences in the ways technical management and senior management perceive the corporate telecommunications function. First, groups of telecommunications managers and senior managers met separately to discuss their individual viewpoints. Then the two groups came together to compare their findings and to identify ways that telecommunications managers can improve their positions within their organizations.

Telecommunications managers were represented by Frances B. Andrews, director of corporate telecommunications for GTE Services Corp. in Stamford, Conn.; Vincent DeGennaro, director of telecommunications at American Can Co. in Greenwich, Conn.; and James S. Ellis, director of telecommunications at Pitney Bowes, Inc., also in Stamford.

Speaking for senior management were William Brown Jr., senior vice-president of Cigna Corp.'s Systems Division in Hartford, Conn.; William Heuser, director of corporate information services at Pneumo-Abex Corp. in Boston; and Gerald Mayfield, president of the DMW Group, Inc. in Stamford.

Lodahl is chairman and Redditt is president of CogniTech Services Corp., a management consulting firm in Easton, Conn.

Telecommunications managers haven't yet succeeded in sloughing off their predivestiture image as people who run technical service departments. Senior management, skeptical of the current rage for the "strategic" view of telecommunications, still sees mainly the old setup: a telephone system, a utility, a technical or operations function and a cost center.

Heuser: Since telecommunications is not a strategic element of our business, I would say that most senior managers in my company just view it as an expense item. I think they have no interest, concern or involvement whatsoever in it, unless some particular problem is brought to their attention. I would say they have no perception of any of the major issues or questions of voice/data, interconnection of the business units, that sort of thing.

The first thing functional managers think of is the business requirement to accomplish something. The next things they think of are the tools at either end. Then, somewhere along the line, someone finally says, 'Oh, we need to tie those together with a communications capability.' So telecommunications is a second-tier item in most companies. Even though the Ken Olsen idea is true, that networking is the key strategic, first-tier technology, that is not a view that would be taken by 99% of senior management.

Brown: We are caught up in media hype about the strategic value of telecommunications. I think many senior managers recognize now, because other people have identified it as a strategic value, that tele-

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communications is a strategic element. But I think, in large corporations, business managers are grappling with questions like, 'How does it make a difference? How does it add value to my product?'

I would venture to say that if you took 10 of the top Fortune 500 companies and asked for their strategic plans for the next five years, you would find references to automation, but you would not find isolated references to telecommunications strategies.

DeGennaro: If you argue the case from the telecommunications point of view, we want positive visibility within the company. If you look at senior management, they say, 'It's another evil we have to deal with.'

Ellis: We have found that charging back on a fully absorbed basis for our services gains us visibility and an understanding on the part of our customers about the cost of telecommunications.

When our users budget their telecommunications costs, we find that they engage in a dialogue with us as to how they can drive their costs down, especially during periods of tight money, and they tend to keep us very honest about our rates.

Brown: Would it bother you if there was a recognition that telecommunications might never be of strategic value to your company?

Ellis: Yes, certainly, but if that is their perspective, then we'll have to accept it. I prefer a dialogue with senior management to prevent this from happening. But senior management can be a two-edged sword, because visibility leads to tough questions on staffing and resource allocation, like 'Why do we always need more trained professional people? We used to run these operations with first-line supervisory people.'

Conversely, dialogue with senior management allows us to make them aware that telecommunications is now an asset that the company owns and operates.

The visibility of telecommunications is frequently taken for granted, like other service functions such as payroll or general ledger. As long as you do your job well and provide excellent services, no one waves the flag for you — but mistakes surface quickly and get inordinate attention. It takes peaceful coexistence with customers over a sustained period to create a receptive audience at all levels, senior management included.

The sine qua non for gaining credibility with senior management is a business orientation.

DeGennaro: We have delivered projects; we have been able to do things that needed to be done. During the past four or five years, we have gotten more corporate visibility because the projects we dealt with involved newly acquired businesses that were in the limelight at that time.

We bought a brokerage company, and we moved them on a weekend. On the day of the move, we had only four circuits down out of 230. On a weekend, it was a miracle, and senior management recognized that. So we've gotten a lot of positive credits.

Heuser: The other aspect of credibility, once senior management understands the business aspect of telecommunications, is planning. Ability to plan is a key to credibility and ultimately to getting resources. The plan must deal not only with the telecommunications organization and how it relates to applications, but also with how it relates to the business. Once those are in place, the question of credibility is diminished.

Credibility is easy to lose.

Andrews: There are plenty of things that will cause a manager to lose credibility: poor quality, poor service, missing a date, failing to deliver on financial projections in the original time frame and allowing costs to escalate.

Mayfield: The cases I have seen where credibility is most seriously damaged are where the telecommunications function is not run as a business, and where there is not an awareness of unit cost and, thus, total costs. You've got to be able to demonstrate improving unit cost or else it doesn't make business sense.

The other thing that damages credibility is failing to deliver. There are a lot of mundane technical details that have enormous impacts on people, and you've got to deliver high service quality.

The telecommunications manager must be able to present the business case and give a business meaning to technology.

Heuser: Too often, people say, 'All we need to do is educate senior management regarding how important we are, and that will solve everything.' In reality, when telecommunications becomes a part of the business and senior management

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1 My primary areas of activity. (Circle ONE only)
I am involved in evaluating communications (data, voice and/or image) products and services:
1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both
4. Other (explain) ____________________

1a For communications, my primary responsibility is: (Circle ONE only)
1. Data Communications
2. Voice Communications
3. Both
4. Other (explain) ____________________

2 Circle only the ONE title classification which most applies to you.

Company Management
11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CEO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management

Data Communications
21. Management
    VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff:
    Supervisor, Head: Networking, Design, Analysis, Engineering, R&D, Applications, Services

Telecommunications
31. Management
    VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks. Engineering, Design, R&D, Application Development
32. Supervisory/Staff: Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services

Factory Communications
41. Management
42. Supervisory/Staff

MIS/Data Processing
51. Management
    VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of Systems Design, Analysis Applications

Others
75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other ____________________

3 Job Function
Which one of the following best describes your functional involvement with communications (data, voice, and /or video) products? (Circle ONE only)

Corporate
1. Business Management, Planning and/or Development

Communications System/Network
2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other ____________________

4 Which one of the following best describes the primary business activity of your organization at this location? (Circle ONE only)

Consultants
11. DP/Communications Consulting Services
12. Consulting Services (except DP/ Communications)

End Users
13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/ Construction/ Petroleum Refining/ Agriculture/ Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors
41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, International Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other ____________________

5 In which ways do you typically become involved in acquiring communication products (data, voice, and/or video) and services? (Circle ALL that apply)
1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6 Check ALL that apply in columns A and B.
A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:
B. These products and services are presently in use at this location:

A B Product/Services

Computers
01. ☐ ☐ Micros
02. ☐ ☐ Minis
03. ☐ ☐ Mainframes
34. ☐ ☐ Printers

Data Communications
04. ☐ ☐ Communications Processors
05. ☐ ☐ Comm./Networks Software
06. ☐ ☐ Digital Switching Equipment
07. ☐ ☐ Facsimile
08. ☐ ☐ Modems
09. ☐ ☐ Multiplexers
10. ☐ ☐ Protocol Converters
11. ☐ ☐ Network Mgmt. & Control
12. ☐ ☐ Test Equipment
13. ☐ ☐ 3270 Controllers
35. ☐ ☐ Intelligent Terminals

Telecommunications
14. ☐ ☐ PBXs
15. ☐ ☐ Key Systems
16. ☐ ☐ Central Office Equipment
17. ☐ ☐ Integrated Voice/Data Terminals

A B Product/Services

Transmission/Network Services Equipment
18. ☐ ☐ Microwave
19. ☐ ☐ Satellite Earth Stations
20. ☐ ☐ Local Area Networks
21. ☐ ☐ Wide Area Networks
22. ☐ ☐ Packet Switching Equipment
23. ☐ ☐ Fiber Optic Equipment
36. ☐ ☐ T1

Communications Services
24. ☐ ☐ Packet Switching Services
25. ☐ ☐ Cellular Mobile Radio Services
26. ☐ ☐ Electronic Mail
27. ☐ ☐ Enhanced Services
28. ☐ ☐ Centrex
29. ☐ ☐ Long Haul Services
30. ☐ ☐ BOC Services
31. ☐ ☐ Independent Telco Services

Other
32. ☐ ☐ Factory Communications
33. ☐ ☐ Online Data Bases

7 Estimated value of communications systems, equipment and services:
A. which you helped specify, recommend or approve in *last* 12 months? (Check only ONE in column A.)
B. which you plan to specify,recommend or approve in *next* 12 months? (Check only ONE in column B.)

A B
1. ☐ ☐ $10 million and over
2. ☐ ☐ $5 million - $9.9 million
3. ☐ ☐ $1 million - $4.9 million
4. ☐ ☐ $500,000 - $999,999
5. ☐ ☐ $250,000 - $499,999

A B
6. ☐ ☐ $100,000 - $249,999
7. ☐ ☐ $50,000 - $99,999
8. ☐ ☐ Under $50,000
9. ☐ ☐ Don't Know

8 Estimated gross annual revenues for your entire company/institution:
(Circle ONE only)
1. Over $1 billion
2. $500 million to $1 billion
3. $100 million to $499.9 million
4. $50 million to $99.9 million
5. $10 million to $49.9 million
6. $5 million to $9.9 million
7. under $5 million

9 Estimated number of total employees at this location:
(Circle ONE only)
1. Over 5,000
2. 1,000 - 4,999
3. 500 - 999
4. 250 - 499
5. 100 - 249
6. 50 - 99
7. 20 - 49
8. 1 - 19

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knows it, we won't have a credibility problem. To accomplish that, telecommunications people need to understand the business functions. So the work of credibility belongs to the information resource person rather than senior management.

Ellis: I am continually being asked to think and act more strategically about what we can do for the company. I'm not being asked technical questions about software-defined networks or voice/data integration.

More and more emphasis is being placed on the question, 'What do you bring to the table that will help us expand our business and satisfy our customers?'

Mayfield: The problem with telecommunications is that the business value has not been easy to demonstrate. But using the value-added chain idea from Michael Porter's book, *Competitive Advantage,* you can show that telecommunications can increase value, which is finally represented as improved margin and higher profits. When telecommunications presents the business case in terms of ultimately improved margins, then senior management will embrace the strategic value.

Today's telecommunications manager must work to change upper management perceptions that limit him by becoming involved in the corporate planning process.

Mayfield: There is a senior management perception of telecommunications as technical, as being preoccupied with technology. There is a strong orientation to the technology of how it's done, not necessarily how it's applied to business problems.

I don't mean to downgrade the importance of technical competence; there is a need to be able to relate the technology to the execution of the business plan.

DeGennaro: I think the only weak point in our charter is the role in business strategic planning. We need to be a little more involved in what's coming down the road so we can better prepare for it. That's not to say we don't do a good job getting things done for them when we have to. But we would like to be able to get a little more involved in the planning aspect.

We would probably agree we are all more reactive than proactive. It would be nice once to say, 'Here's what's going to happen from a business perspective.' Then we could know what we need to accomplish, and when.

Brown: Sooner or later, you have to develop your own credibility however you can, whether it is through the use of consultants or whatever. What makes you viable is being able to sit at the table with your peers and be fully represented as being knowledgeable about the business.

An appropriate vision by senior management can be of enormous help in repositioning the telecommunications function within an organization.

Brown: Organizational positioning is very important; so is awareness of strategic value at the top of an organization.

In the 1970s, Walter Wriston at Citibank [N.A.] said the companies who invested in technology then would be the leaders in the 1990s. I didn't understand all that then, but now when I think of his awareness as a CEO of the importance of technology, it's incredible. Whatever caused him to have that clear vision, that's what we need now.

Heuser: What you're talking about here is having a person at the top with a vision. We can't give them that vision. But we can make the case for the strategic element of telecommunications in the business plan.

There are both technical and business driving forces in the telecommunications organization. The technical drivers point to telecommunications being in or with MIS, and the business drivers point toward its standing alone.

Brown: I believe that voice/data integration requirements, as perceived by the MIS departments, currently far exceed the capabilities of the PBX. Therefore, it's difficult to make it cost-effective because of lack of strength of the array of products currently available to us.

Heuser: Perhaps what we are saying here is that the state of the technology today doesn't encourage an organizational structure that puts these things together.

Andrews: But if you look to the future — the drive for office automation, the local-area networks that are coming in, the PBXs, the merging of digital information in the switches — for all of these you need the two running together: information management and telecommunications. You need the cooperation of the two groups.

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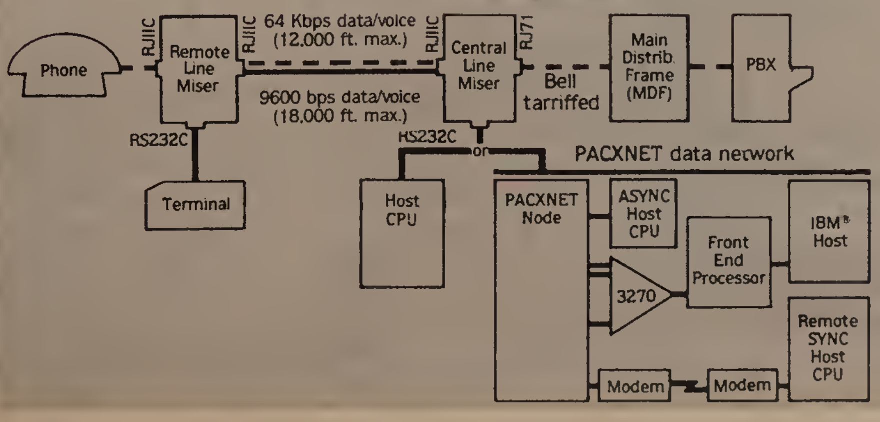

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Making two separate groups causes a barrier in that sharing of knowledge.

DeGennaro: But positioning telecommunications as a corporate entity gives it more recognition than it has had traditionally. You're not just a resource or a service center. You are doing a lot of things in support of the business.

Brown: The only place MIS is strategic is in application development. The operations function is still viewed as a cost center, so to the extent that telecommunications has those attributes, it might never become viewed as strategic.

Andrews: By integrating telecommunications planning into MIS planning, that's where you have your impact. Not having two separate guidelines, but making the field organizations aware that telecom and MIS have to function together.

DeGennaro: We report through MIS right now; we've been in MIS since I've been with the company. Maybe we should stand alone. We do some things with MIS on an integrated basis, but not that much. Maybe we should broaden the scope.

I don't want to be a corporate guru and do everything, but from a true corporate perspective, I think it would be a good move to go across the businesses, know what they are doing and try to plan for what they are doing.

MIS is good to report through as an alternative. Where we get clouded sometimes is if there is political infighting. When you go up in front of a business in a decentralized environment, and if you are associated with an entity like MIS, the people look at you and say, 'Uh-oh, they're out here to do something to us. What are they doing here?'

They may not have telecommunications expertise, but sometimes we get lumped into the barrel as another corporate influence to deal with.

Mayfield: There has been some reluctance from MIS to assume the responsibility of voice. It would expose them to the great unwashed masses instead of just technical professionals.

Heuser: Part of it depends on the particulars of the organization. If there are dissimilar business units and they are large, the whole [chief information officer] organization might report to the business unit.

There might not be a corporate telecommunications person, if there is no perceived need for a corporatewide telecommunications strategy.

Mayfield: But if you have complementary lines of business, even though they are run as separate business centers, it's smart to look across the functions in those relative business centers to see whether you can reduce cost or add value by combining functions or providing better communications.

In that case, a central operation is essential.

DeGennaro: We have locations that have the individual expertise, but when it comes to a major project, they still need to have somebody come in, get involved, do the analysis with them and present the individual project. But for day-to-day operational needs, like adding a circuit, they are pretty much self-sufficient.

Let's talk about the trend toward decentralization. We can implement a network in a decentralized corporate environment and still have corporate control. You sell it. Products like virtual private networks are coming out now that give you multiple management capabilities and allow you to achieve many different levels of control.

I know we can implement a VPN across our company, still have an overall network management framework, provide a standard dialing plan and have everybody think they are utilizing individual WATS lines.

Senior management favors having both MIS and telecommunications report to a Chief Information Officer (CIO).

Heuser: For the integration of data bases, applications and hardware, there has to be a point of organizational integration. Otherwise, everyone goes his own way and thinks only of the needs he has, independent of the others.

Brown: That suggests we agree that there is a set of core functions that provide, from an internal standpoint, all of the connectivity, interfaces and responsibilities of all of the various application development organizations, and from an external standpoint, the various user communities.

Mayfield: This network control function should report to the CIO. Other functions that also might report to the CIO include application development, application architectural design, voice and data communications, hardware, computer center operations and data base administration.

What we are saying here is that what is needed within an organization is a CIO who has responsibility for all these functions and who reports to the president.

Heuser: If you look at people who are CIOs, more and more you see that this person did not come up the MIS route. The CIO is a person who was a good business manager and who not only understands his business, but has some appreciation for the way information can be used in the business.

So the question of whether telecommunications managers can ever make that leap is no different from asking the same question about MIS managers. Some do and some don't. In companies where there is no one who can make the leap, often they'll put a generalist in charge.

The lesson for telecommunications managers is that, as far as senior management is concerned, you can delegate the technical side, but not the business side.

If the telecommunications manager wants to gain credibility with senior management, he will have to learn to do what the CIO does: think business, talk business and translate technology into business for the rest of senior management.

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Letters

Where's DEC?

I have been reading *Network World* for approximately a year now. Many articles are interesting and informative. Your paper gives me a good look at the rest of the industry. But I have noticed over time a lack of information on Digital Equipment Corp. As a DEC user, I find this surprising. DEC, after all, does have quite a market share in departmental computing and networking.

What prompted me to write this time is an article in the March 9 edition. "Which LAN is your LAN?" does not even mention DEC as a vendor. I find this a major oversight. DEC is, after all, one of the largest sellers of local nets.

Why is DEC often left out? I am curious.

Jan J. Gombotz
Systems manager
Immunex Corp.

In the April 6 issue, Network World *will feature a special section on Digital Equipment Corp., including an exclusive interview with Ken Olsen, DEC's founder and president.*

A production error resulted in the omission of information about the DECnet local-area network from the chart accompanying the March 9 article. DECnet's technical characteristics were listed in a previous local net product focus in the Oct. 20, 1986 issue of Network World. — *Editor*

Don't forget V.32

Regarding the fine article, "Analog lines still shine," in your March 2, 1987 edition, you neglected to explore an excellent alternative to digital circuits and leased lines. The latest generation of V.32 modems can operate at 9.6K bit/sec full duplex over the public switched telephone net (PSTN).

With built-in trellis coding (forward error correction), they have a better signal-to-noise ratio than slower speed modems and V.29s operating on leased lines. They are an exception to the article's 4.8K bit/sec or less rule of thumb as a switchover point for going to digital.

It should also be noted that with the declining prices of PSTN access for the casual leased-line users or those with usage of less than two hours per business day, significant savings will begin after about nine months when using the V.32 on the PSTN.

No conditioning or nonrecurring installation charges are required either. If you are a slow-speed modem user (2,400 bit/sec), the payback for switching to V.32 can be between four and six months at two hours a day or less of usage.

Howard A. Raphael
Chief executive officer
Cermetek
Microelectronics, Inc.

Letters may be edited for space and clarity.

AT&T from **page 1**

Wang VS and OIS users, and personal computer users; and a new release of Unix that includes communications enhancements.

Also included in the announcement was a new release of AT&T's Information Systems Network (ISN), two new Starlan servers and enhancements designed to extend Starlan's distance coverage and improve its user interface.

The division's sales efforts were also bolstered by the addition of 500 dedicated support people who will provide technical information to 600 direct computer salespeople. Sales staffers have been criticized for a lack of understanding of Data Systems' products.

Cassoni said Data Systems is already ahead of sales projections for this year, although analysts attributed that early-year improvement to AT&T's accounting practices. His goal for the division is to turn a profit within two years. Last year, the division lost an estimated $800 to $900 million, according to Taylor.

The new products are geared toward five "strategic" types of work groups within an organization. Cassoni, who came to AT&T from Ing. C. Olivetti & Co. S.p.A. last November, said the division will focus its sales on these groups, which include personal computer, departmental, production (data processing), campus and corporate work groups.

At the personal computer workgroup level, Data Systems will focus on melding DOS and Unix. Said Cassoni, "Unix is the only operating system that can bridge PCs and minicomputers." In the near term, that bridging will be done through Starlan servers, which run Unix but will support MS-DOS-based personal computers.

The new servers, 3B2 models 310 and 400, are preconfigured with network hardware and software, an MS-DOS server program and a Unix V Release 3 operating system. The servers can support up to 50 personal computers and provide up to 6.5G bytes of storage. Server software provides file sharing, record-level access, record locking, password protection, print serving for multiple printers and printer spooling.

Later this year Data Systems will bring out an AT&T 80386-based machine which will "use Unix with DOS to exploit the power of Intel [Corp.] chips and DOS applications," Cassoni said.

David Terrie, editor of "The Network Monitor," an industry newsletter, applauded this move. "The melding of Unix and DOS is the best thing that could happen to Unix and, in some ways, to DOS. It really provides a useful addition in functionality to the marketplace and diffuses a critical decision that a user might be faced with."

AT&T's Starlan local network was also enhanced to serve the personal computer work group. The Starlan network repeater unit, used to link multiple network extension units, can now reach 800 ft instead of the original 10 ft, enabling the total diameter of a Starlan network to cover 8,000 ft.

Starlan was further enhanced with the Menus 2.0 Upgrade Kit, designed to simplify the user interface to the network.

Cassoni indicated Starlan adapter prices will come down in the second half of 1987, and that Data Systems may increase the speed of its local network offerings in the future.

The departmental work group received the greatest amount of new product attention. The AT&T LU 6.2 Facility, headlining the 3B2 connectivity enhancements, is an application interface that enables programs written to the facility to communicate directly, regardless of the operating system used. The facility is based on software from The Orion Group.

Departmental 3B2 users will also be able to exchange electronic mail messages with users on IBM's DISOSS and PROFS office systems, Wang's VS/OIS systems, MS-DOS-based personal computers and the AT&T Mail public network, using AT&T Document Exchange. Word-processing format translation is provided for IBM's Document Content Architecture and Document Composition Format, Wang's Standard Word Processing, Multimate International's Multimate program, final form ASCII and Unix NROFF. Unix-based gateways are employed to communicate with other electronic mail facilities.

The gateways are based on 3B2/310, 400 or 600 computers running software that provides system management, electronic mail capabilities, connectivity subsystems, multivendor bridging functions and translators, all based on software from Soft-Switch, Inc.

In addressing the campus work group, Data Systems announced Release 4.0 of its Information Systems Network, a data-switching scheme for local- and wide-area networking. Specific enhancements added to Release 4.0 include a software driver supporting the connection of Digital Equipment Corp. VAX VMS systems to ISN over optical fiber. The driver supports terminal logon, remote host access, and DECconnect functions between DEC hosts and synchronous ISN end points.

In addition, DECnet upper layer protocols are now certified to operate across ISN's Ethernet Bridge Interface Module.

ISN management was enhanced with the Starkeeper I Network Management System, which provides local and remote administration functions, network reports, fault tallies, route alarms and data-entry replication features. The network management program runs on AT&T's Unix PC.

New products addressing the corporate work group include the Dataphone II 740 Acculink Multiplexer. An extension to the T-MUX product line, it provides compatibility with Accunet T1.5 service functions and Dataphone II products. Data Systems also brought out Release 2 of the Office TeleSystem, an integrated voice/data software program that runs on 3B2 computers.

TCA from **page 2**

"This is a response to what is happening to us, and what is happening to us is growth," said Dyess, director of telecommunications at Scripps Clinic in La Jolla, Calif. "We know we have to change our organizational structure to deal with that growth. We are recognized across the country, but we are set up primarily as a Western organization."

There are TCA chapters in Oregon, Washington, Arizona, Colorado and three in California. Dyess said the organization has members in all but 10 states, representing more than 1,000 users organizations. State chapters would meet in regional conferences.

The proposed expansion comes at the urging of users both within and outside TCA, said Gillerman, manager of network technology at McDonnell Douglas Corp. in Cypress, Calif. He added that the changes are necessary to prepare the group for the future.

"It will take a while to get this process completed," he said. "If we don't start now, we won't be ready for the '90s. We want to be the most respected organization in the telecommunications users' arena."

In addition, Gillerman said, vendors are interested in the group taking a more assertive role in specifying the kinds of services and equipment users need.

At a Feb. 26 meeting in Redondo Beach, Calif., of incoming and outgoing TCA officers, officials reached a "consensus in favor of the move to go national and international," Gillerman said. Dyess said a conservative estimate is that the organization could expand by at least one chapter per year for the next six or seven years.

The minimum number of people needed to form a chapter will be about 25, Dyess said.

Dyess and Gillerman added that expansion of TCA, which was formed in 1961, would not put the group into conflict with the International Communications Association (ICA), a users organization with a nationwide membership.

According to Dyess, the two groups differ in that ICA does not represent small and medium-sized telecommunications users. To qualify for ICA membership, a users organization must have an annual communications budget of at least $1 million.

Dyess said TCA chapters deal primarily with concerns of local members at their monthly meetings. He added that a national organization would be more effective in joining with ICA to champion users' interests, particularly regarding regulatory matters.

Gillerman said he was confident the expansion plan would win the support of the group's membership. But, he conceded, not all TCA members favor expansion.

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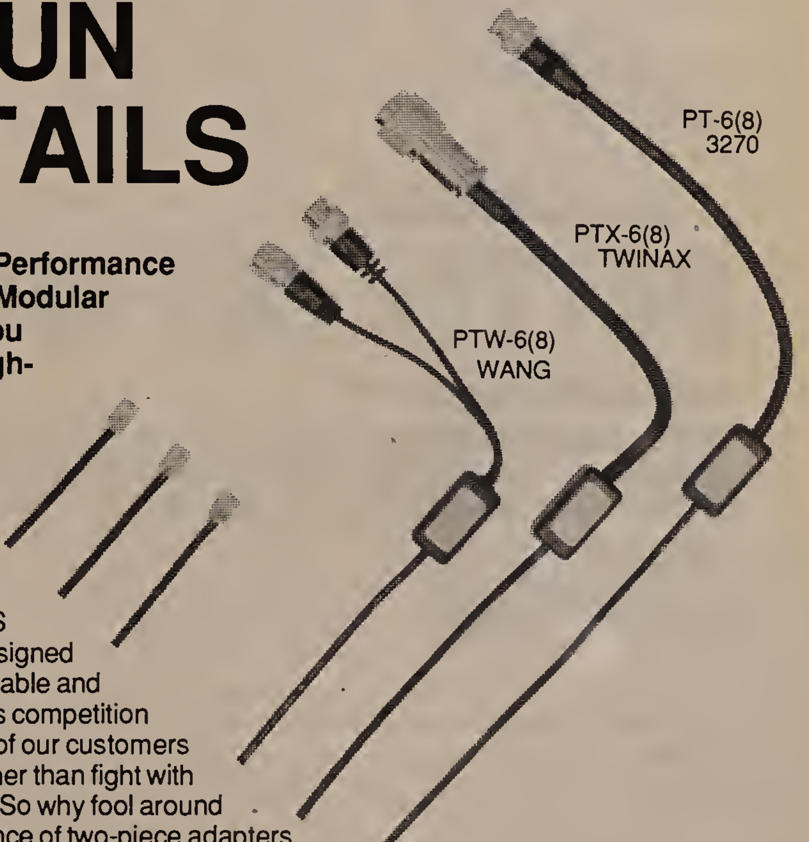

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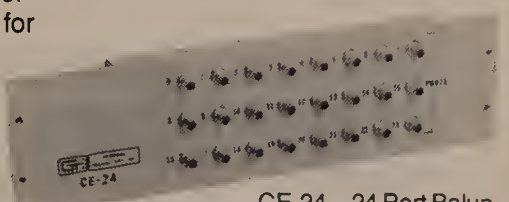

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DEC from **page 1**

Olsen's comments elicited strong responses from members of the MAP/TOP Users Group. "Olsen doesn't understand broadband technology at all, and everyone in the industry knows that," said Charles Gardner, chairman of the MAP/TOP Steering Committee and a senior engineer with Eastman Kodak Co.'s control systems and computer technology division.

Introducing DEC's new industrial computer family, Olsen said the company would not earmark manpower or financial resources to develop products that conform with the evolving MAP specification. The intent of the product barrage is to move DEC's VAX processor family and the company's DECnet network onto the factory floor.

New products include: the Industrial VAX 630, designed for supervising or controlling a group of similar tools in a manufacturing cell, which is a segmented area on a factory floor; the Industrial VAX 620, developed to control robots and other devices that require real-time response time; and the Industrial PDP-11, a factory-floor version of a processor previously used in manufacturing plant computer rooms.

DEC also enhanced its Baseway factory device data collection system for factory-floor use.

The DEC president said system integration is the key to factory automation and the addition of the industrial family of products makes DEC "the only computer supplier to offer a full range of systems, applications and services based on a single systems and networking architecture."

Olsen steadfastly maintained that baseband Ethernet local-area networks — the foundation of DECnet — can handle the communications requirements of factory-floor equipment.

MAP specifies use of broadband network technology and outlines requirements that, when adopted by vendors, would enable different makes and types of computers to work together in a factory network.

Olsen said of DEC's future commitment to MAP, "We don't have a few hundred million dollars and 10,000 people to perform hardware and software testing and provide documentation and support services for MAP. We have our hands full with 100,000 people working on Ethernet."

Despite Olsen's anti-MAP comments, DEC has developed networking components compatible with MAP Version 2.1. But David Copeland, manufacturing/CIM marketing group manager for DEC, said the company will not introduce products for the latest iteration of MAP, Version 3.0, until the specification is polished. "We expect it will take another two years for the specification to become stable."

Asked why DEC has developed MAP-compatible products at all, Olsen replied, "Because GM asked us to. And when GM [DEC's biggest customer] asks you to do something, you do it."

David Scott, division manager of the computer-aided manufacturing systems department at East Moline, Ill.-based Deere & Co., said he is bewildered by the mixed signals DEC is sending out concerning MAP. "DEC always stands up front at users group meetings and talks about MAP products and its plans for MAP in general," he said. "I don't think we are going to stop the MAP bandwagon for DEC."

"Olsen's words will certainly affect those users who are keeping an eye on the MAP movement," said William Geibel, chief electrical engineer for the Erie, Pa.-based Kaiser Aluminum and Chemical Corp.

"I expect many users will decide to take a wait-and-see stance with MAP," he added.

Geibel oversaw the installation of a broadband network compatible with four of the seven layers of MAP Version 2.0 in the company's Erie plant in 1985. "The network runs at 5M bit/sec and operates well," Geibel explained. "I don't see Ethernet networks as being able to handle even half of my factory communications needs." The MAP net boasts roughly 200 nodes, which communicate over a single channel of a three-channel broadband network.

William Veeneman, a design specialist with the Cincinnati-based Procter & Gamble Co., also serves as chairman of the MAP/TOP Users Group's Process Industries Special Interest Group.

Speaking as a member of the users group, Veeneman said he suspected there are many potential MAP users who will be confused by Olsen's comments. "I'm not going to let one man tell me that everything we are doing in factory networking is wrong," he maintained. "There is still a future for MAP."

PacBell from **page 4**

Project Victoria, Rudov argued, is a way to offer more services over existing customer lines.

He said the Pacific Bell method requires the addition of gear to the central office and a multiplexer/transceiver box at subscriber sites.

But other observers said Pacific Bell's intent may be partly to create a proprietary interface that would lock in customers.

"In the Project Victoria scenario, as long as the Project Victoria box remains a proprietary element, the only way you can get those kinds of services is through Pacific Bell," said Mary Johnston, a telecommunications consultant at BBN Communications Corp. "From a marketing point of view, it's a way of roping in customers."

Johnston also said that, since ISDN standards are not to the point where they can address certain subrate applications, Pacific Bell may simply be forging ahead to avoid having to wait for open standards.

"There hasn't been a lot of work on breaking ISDN channels into smaller channels for applications," Johnston said. "It will be a proprietary function of Victoria to break up the B channel and route it to all the enhanced services. It's those protocols that are proprietary."

AT&T from **page 4**

in Japan.

Olson stressed the importance of such relationships for penetrating international markets. "Few customers in any area of the world are trusting enough to buy a million-dollar piece of equipment from an outlander," he said.

While not internationally recognized as an equipment vendor, AT&T does have a firm footing in international long-distance, with annual revenue of about $2 billion. "International long distance is still a strong and profitable business," Olson said, pointing to the steady influx of circuit orders the carrier has received for its TAT-8 transatlantic fiber-optic cable.

AT&T restructured its international group, AT&T International, Inc., formerly a separate organization, to bring international sales and marketing operations under the appropriate domestic lines of business for each product category, Olson said. AT&T will concentrate those international resources on "business and government customers who have major requirements for information movement and management systems," he added.

Olson expressed frustration over political factors barring AT&T's entry into foreign markets. "Innovation and demand have been the greatest in those nations where trade restrictions have been removed or relaxed," he said. "Trade barriers are pulling on the shirttails of progress."

Among AT&T's international struggles has been its battle to crack the French market, bidding with Philips and Societe Anonyme de Telecommunications for partial ownership of the state-owned equipment manufacturer Cie. Generale des Constructions Telephoniques.

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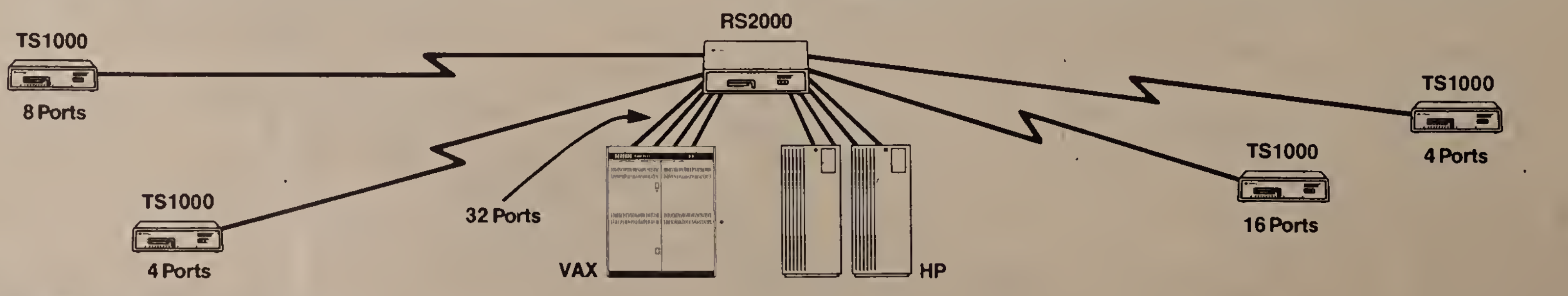

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Computer III from **page 1**

sued in June. The FCC ruling on protocol processing completed Phase 2 of Computer III.

Although most of the affected companies had been able to get around the separate subsidiary stipulation by filing waivers with the FCC, they must now abide by new cost-allocation rules and submit plans for complying with the agency's Comparably Efficient Interconnection (CEI) and Open Network Architecture (ONA) schemes.

The agency rejected a proposal that protocol processing be provided as a part of basic services.

Most observers agreed that the FCC struck a harmonious balance by allowing AT&T and the BOCs to provide protocol conversion with their data communications services while protecting users and other vendors. The ruling is expected to spur the introduction of new services that widen users' data networking options.

Hastening the arrival of such services seemed to be uppermost in the FCC's priorities. "Adoption of the Phase 2 rules brings to a close the initial stage of our efforts to reformulate the way in which AT&T and the BOCs can participate in competitive markets for enhanced services," FCC Chairman Mark Fowler said. "This concludes our road map for the competitive future. The incentives for innovation are in place. The safeguards to keep competition fair are enacted. We have set the stage for the information age to begin."

James Blaszak, legal counsel to the Ad Hoc Telecommunications Users Committee, agreed with others that the FCC's ruling was confusing and needed to be carefully assessed. (The full text of the ruling is expected to be released in about a month.)

But he said he was pleased the FCC chose to categorize protocol conversion as an enhanced service under strict cost-allocation rules. Users would have paid more for protocol conversion if it was provided as part of basic service, he said.

An AT&T spokeswoman said the company was pleased by the FCC's action, but she would not divulge AT&T's plans for new services.

For the most part, the BOCs were pleased with the FCC's new rules. "The FCC's actions demonstrate the industry is headed in the right direction. We are set to usher in the information age," said David Berry, vice-president for federal regulatory affairs at Bell Atlantic Corp.

The agency rejected a proposal that protocol processing be provided as a part of basic services.

Value-added network providers breathed a sigh of relief because the FCC's ruling will allow them to continue conducting business as usual. One proposal before the FCC would have subjected packet carriers such as Telenet Communications Corp., a division of US Sprint Communications Co., and Tymnet/McDonnell Douglas Network Systems, Inc. to agency oversight. The companies also applauded the FCC's decision to impose the CEI and ONA stipulations.

Claudia Houston, a spokeswoman for Reston, Va.-based Telenet, said, "This looks like very good news for the [value-added network providers.] The FCC has decided not to regulate us. Also, protocol conversion will remain enhanced and ONA is mandatory."

In Phase 1 of its Computer III ruling, the FCC said AT&T and the BOCs were not required to form separate subsidiaries to market all other enhanced services providing they met CEI, ONA and accounting rules designed to prevent cross-subsidization of competitive ventures from regulated activities.

Under Second Computer Inquiry rules, the firms had to form separate subsidiaries to market protocol-conversion services in conjunction with packet-switching services, although a later decision allowed the companies to file for waivers to the requirement.

CEI and ONA are safeguards designed to replace the Computer II separate subsidiary requirements. They are designed to ensure that the BOCs and AT&T do not use their monopoly power to discriminate against competing enhanced service providers.

CEI requires carriers to provide the same type and quality of service to their competitors as they use to provide enhanced services. The BOCs must charge their competitors the same price for access or services as they charge themselves.

ONA requires the BOCs to unbundle all basic service elements into so-called basic service elements and to make those elements available to enhanced service providers and end users. It is intended to ensure that competitors and users have access to all the capabilities that the BOCs enjoy.

CALENDAR

March 30-April 2, Las Vegas, Nev. — Interface '87. Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

April 2-3, San Francisco — Telecom System Maintenance: Management and Cost Control. Contact: *Business Communications Review*, 950 York Road, Hinsdale, Ill. 60521.

April 6-8, Lowell, Mass. — Data Communications Systems & Networks. Contact: Data Communications Institute, 55 Main St., Madison, N.J. 07940.

April 6-8, Boston — The 1987 Facsimile and Image Communications Conference. Contact: CAP International, Inc., One Snow Road, Marshfield, Mass. 02050.

April 7-9, Sydney, Australia — Telecommunications Means Business. Contact: The Australian Telecommunications Users Group, P.O. Box 357, Milsons Point, N.S.W. 2061.

April 7-10, Palo Alto, Calif. — Integrated Voice/Data Communications & ISDN. Contact: Integrated Computer Systems, 5800 Hannum Ave., P.O. Box 3614, Culver City, Calif. 90231.

April 8-10, Dallas — IBM Products & Architectures. Also, April 22-24, Arlington, Va. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92750.

April 9-10, Washington, D.C. — T-Carrier Networking Decisions. Contact: The George Washington University, School of Engineering and Applied Science, Washington, D.C. 20052.

April 9-10, New York — Satellite Status '87. Contact: Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

April 13-15, Vancouver — Info Canada '87. Contact: Vancouver Chapter of Data Processing Managers Association, c/o Venue West, 801-750 Jervis St., Vancouver, B.C.

April 13-15, Colorado Springs — An Introduction to Data Communications. Also, April 22-24, Chicago; May 4-6, St. Paul, Minn. Contact: The American Institute, 55 Main St., Madison, N.J. 07940.

April 13-16, Salem, N.H. — Designing and Installing Fiber Optic Networks. Contact: Clifford, Inc., P.O. Box 51, Bethel, Vt. 05032.

April 14-16, Chicago — Telecommunications Transmission Systems. Contact: abc Teletraining, Inc., P.O. Box 537, Geneva, Ill. 60134.

April 15-17, Boston — LANs. Contact: Institute for Advanced Technology, 1450 Energy Park Drive, St. Paul, Minn. 55108.

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▶ PRODUCT REVIEW

Attention, switch shoppers!

Before buying, be sure to compare these two digital matrix switches.

BY JOHN J. HUNTER
Contributing Writer

If you're in the market for a digital matrix switch, and Bytex Corp. and Data Switch are on your list, take time to read this before calling your sales representative.

When Data Switch rode to the rescue of T-Bar, Inc. earlier this year to thwart a takeover attempt by John Beall Co., it acquired T-Bar's popular Series 2001 Data Switch Matrix (DSM). DSM was introduced at the 1985 Tele-Communications Association Show in San Diego, and according to the vendor, about 100 systems are now installed.

Last September, Bytex introduced the Autoswitch 4000, which has almost doubled the port-handling facilities of the DSM. While both switches provide excellent digital and analog data-handling facilities, both also have some notable drawbacks.

Architecture

The Autoswitch 4000 and DSM are large-scale, nonblocking matrix switches that use a distributed architecture consisting of a central switching unit and collocated satellite switches. The satellites interface with host computer front-end processors, modems, terminals and multiplexers, and permit individual analog and digital data channels to be switched around the user's network.

The Autoswitch 4000 and DSM central switch units contain the hardware and software needed to connect satellites, establish switching matrices and handle network control. The satellite units contain the port interface cards and software that link the satellites to the central switch.

The satellites can be located up to 300 ft from the central controller. The satellites and central switch have redundant power supplies, interface cards and control logic that switch on automatically to ensure continued system operation in the event of a primary unit failure.

The Bytex unit can be configured with up to 4,096 ports spread over as many as 16 satellites, each accommodating up to 256 ports.

The Data Switch DSM provides up to 2,048 ports over seven satellites, each of which holds as many as 320 ports. According to Data Switch, the central switch unit can handle up to 16 satellites, but the total number of system ports is limited to 2,048. Data Switch says it will introduce a 4,096-port facility sometime this year.

With the Autoswitch 4000, the central switch doesn't accommodate port switching, so the customer is forced to buy a central switch and satellite, even if only a few hundred ports are to be switched.

In addition to the cost of buying two pieces of equipment, users must consider the matter of space. With many computer rooms already overcrowded, having to add two units might not sit well. Each measures about 6 ft by 2.3 ft by 3 ft deep, for a 6.6-square-ft size.

Data Switch gives the customer a choice. The DSM is available in the Galaxy and Monolith versions. The latter is a stand-alone single cabinet unit, which supports up to 320 ports.

Two digital matrix switches compared

	Vendor/Product	
	Data Switch Corp./ T-Bar DSM 2001	**Bytex Corp./** Autoswitch 4000
Total ports	2,048	4,096
Ports per satellite	320	256
Total number of satellites	16	16
Price (for 600 and 1,200 ports)	$250K and $423K	$200K and $350K

SOURCE: TMS CORP., DEVON, PA.

When users require more port capacity, they must move to the Galaxy system, which accommodates up to 2,048 ports over 16 satellites. However, the Galaxy central switch cabinet suffers from the same deficiency as the Autoswitch 4000, in that it doesn't accommodate port switching.

Monolith customers are not stuck with a worthless piece of equipment once they upgrade to the Galaxy because Monolith units are used as satellites in the Galaxy system. In addition, when users move to Galaxy, there's no need to make cable changes. The Monolith and Galaxy cabinets have the same dimensions, about 6.5 ft by 2 ft by 2.5 ft deep, giving a footprint of 5 square ft.

Both switches provide excellent digital and analog data handling.

The Autoswitch 4000 and DSM are offered with analog and digital port interface cards. Bytex puts 16 ports on each analog card, and eight ports on each digital card.

The analog unit supports four-wire Type 3002 voice-grade circuits. The digital cards are available with RS-232-C or CCITT V.35 interfaces and handle asynchronous data rates to 19.2K bit/sec and synchronous rates to 76.8K bit/sec. With RS-232-C cards, the Bytex switch can be configured to its full 4,096-port capacity. When the higher speed V.35 cards are used, however, the capacity of each satellite drops to 128 ports.

The reason for the port reduction has to do with the time-space-time (TST) multiplexing technique matrix switches use, which requires the use of multiple time slots to service high-speed data. Data Switch uses a proprietary time-slot assignment technique in the DSM, so that no port reduction occurs at 56K bit/sec for digital data service transmission.

For standard V.35 transmission, however, the DSM fares far worse than the Autoswitch 4000 on a per-port reduction basis, suffering a four-to-one port reduction that reduces each satellite to handling 80 V.35 ports.

If the data rate increases to 153.6K bit/sec, the port reduction is eight to one, or 40 ports per satellite. If the speed is 153.6K bit/sec, the maximum distance between the Monolith and Galaxy is 50 ft. The Autoswitch 4000 does not support 153.6K bit/sec transmissions.

The DSM analog and digital port cards support the same type of interfaces and have the same top asynchronous data rate as the Bytex unit. The DSM can also be configured with a CCITT X.21 interface.

Data Switch uses a different packaging scheme than Bytex, placing only 4 ports per card. The drawback of such packaging is that it requires more card shelves to accommodate the same number of ports, and the user must buy more cards when spares are inventoried. The cost of inventorying cards could be an issue, depending on the number of cards bought.

The single-quantity price for the DSM voice and data cards are: $680 for RS-232-C, $1,270 for V.35, $1,525 for V.35 DSU and $733 for the analog unit. By contrast, the Autoswitch 4000 cards cost $1,100 for RS-232-C, $3,000 for V.35 and $2,750 for analog.

Keep in mind that the Bytex unit's data cards have twice as many ports as the DSM, and the voice card has four times as many. The shelving adds height to the DSM cabinet, but probably won't be an issue in most computer rooms.

Damage control

A major concern with having multiple ports per card is how extensive service disruption will be if a card fails. With the Bytex unit, from eight to 16 ports go down with each card failure. With the DSM, no more than 4 are lost.

While the Autoswitch 4000 does allow a port designation to be changed through software, changing a port card from data terminal equipment (DTE) to data communications equipment (DCE) involves swapping a connector panel. The switch uses connector panels with leads from 32 ports, all of which must be DTE or DCE.

To change a port card, users must swap out an entire panel or use a crossover cable to change the port's interface. The DSM doesn't require such surgery, since its backplane lets users interchange DTE or DCE port cards within the same slots. In fact, users can put analog cards into digital card slots by inserting an interface adapter on the card.

The DSM and Autoswitch 4000 permit users to assign channel priorities that can be used to force the disconnection of an active channel from a desired port. This is quite useful, since it ensures that priority users won't have to wait until other users voluntarily relinquish a desired port.

However, the way the Autoswitch unit handles a port disconnect might cause throughput problems since the disconnect decision is removed from operator control.

The Autoswitch 4000's system software monitors the user's priority and causes an immediate forced disconnect of low-priority users when they are occupying a port needed by a high-priority user.

For interactive users, being forced off will probably be a minor inconvenience. For terminal users sending large batch files, a forced disconnect might mean having to retransmit the entire file.

DSM gives users the option of immediate forced disconnect or operator-controlled disconnect. In the latter case, the switch's control software notifies the operator that a port is busy and gives him the option of initiating a forced disconnect or waiting for the activity on the port to cease.

When asked about the Autoswitch's forced disconnect scheme, Bytex said there was no point in making a high-priority user wait to gain access to a busy port. Therefore, the company gave the software the ability to force disconnect.

Hunter is president of TMS Corp., a marketing management consulting firm in Devon, Pa.

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